

HEAT-TIMER®

INSTALLATION AND OPERATION INSTRUCTIONS

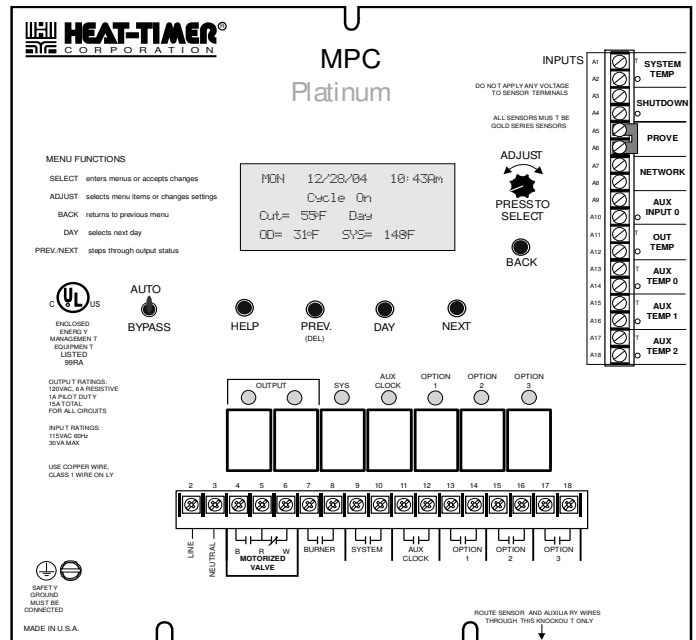
MPC Platinum

STEAM CYCLING HEATING CONTROL

RESET CONTROLS FOR STEAM HEATING SYSTEMS

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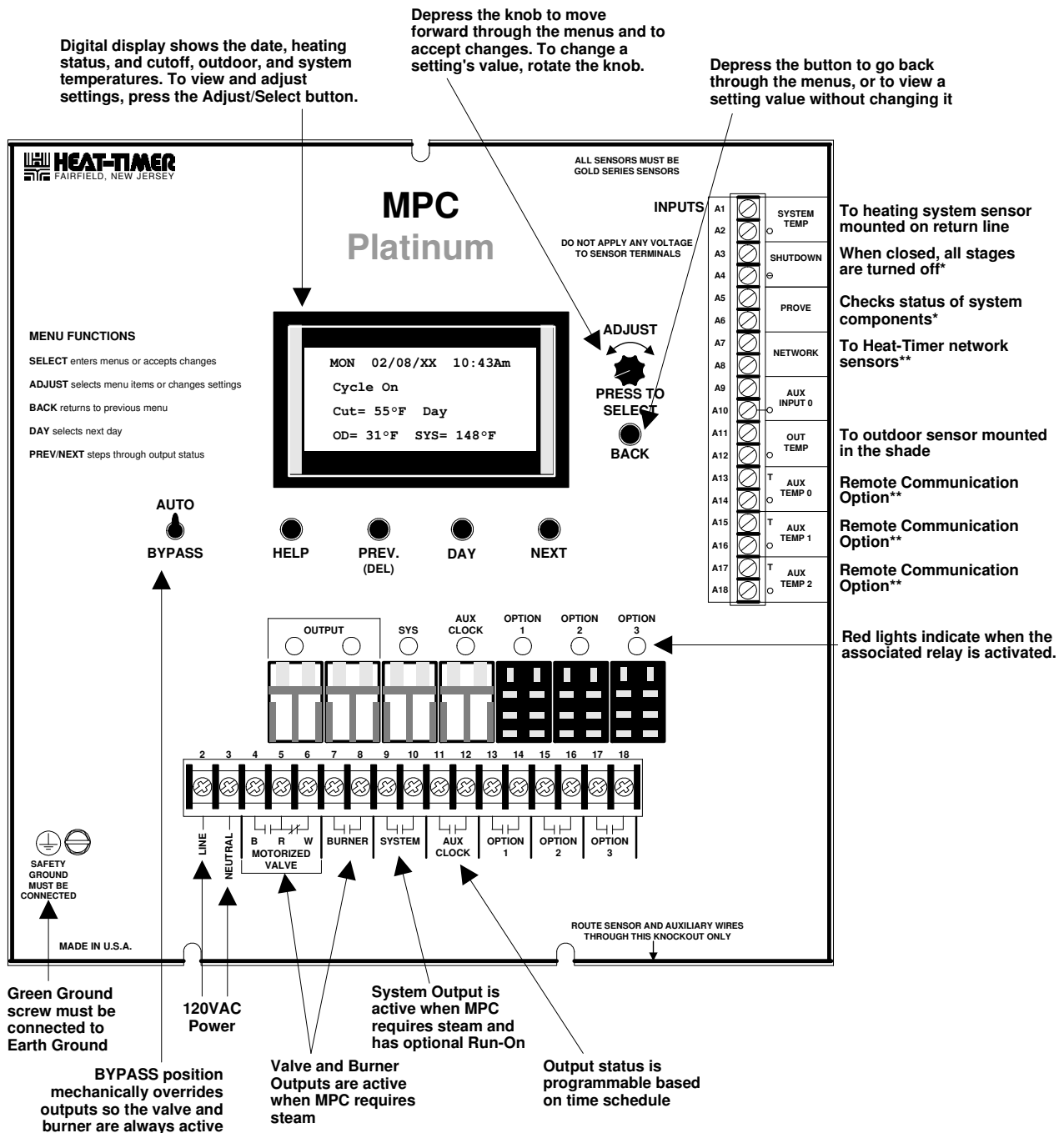
This Preliminary manual attempted to be complete and accurate at the time of publication. Additional upgrades and new features may change MPC functions. Upgrades to this manual may occur at any time. Contact the factory for further details.

⚠ WARNING

The MPC Platinum is strictly an operating control. It **CANNOT** be used as a limit control. The boiler must have all safety and limit controls required by code. It is the responsibility of the installer to verify that all the safety and limits are working properly before the MPC Platinum is installed.

This control must be installed by a licensed electrician.

MPC FUNCTION CHART



* DRY CONTACT ONLY

** Only available with the Remote Communications package

UNDERSTANDING THE MPC

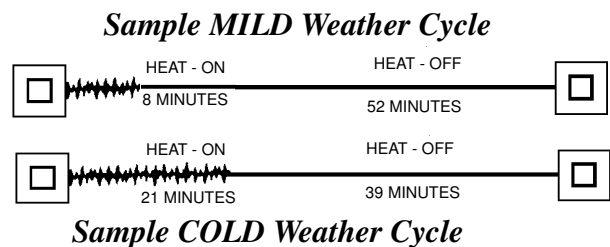
CYCLE PRINCIPLE

The Heat-Timer MPC is a microprocessor based control for steam heating systems. The control operates a steam boiler or valve, automatically providing the desired heat pattern for a building.

The control operates on the CYCLE principle which was created specifically for steam heating systems. The CYCLE concept was developed by Heat-Timer to overcome the inabilities of standard thermostatic controls to cope with the unique challenges of steam heating. The temperature of steam cannot be regulated as with hydronic systems, and steam heat cannot be switched on and off instantaneously as with hot air systems. Instead, it takes time to build up a "head of steam". And, once the system starts heating up, it has momentum which cannot be quickly stopped.

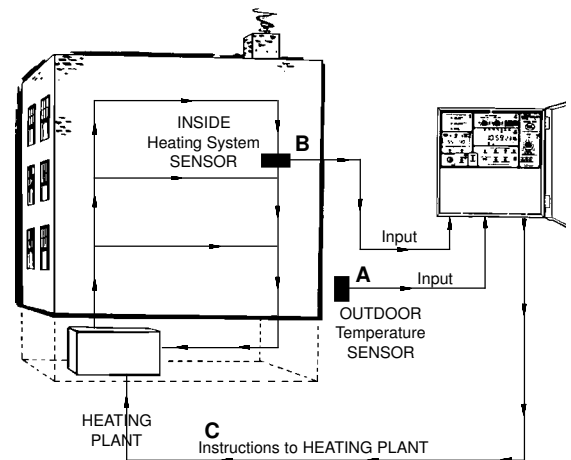
CYCLE LENGTH BASED ON OUTDOOR TEMPERATURE

By monitoring the outside temperature, the MPC is able to anticipate the heating needs of the building. Each fixed time CYCLE period (usually 60 minutes long but adjustable depending on the type of radiation) is divided into a heat-ON segment and a heat-OFF segment. The length of the ON segment will vary with the outside temperature. The colder it is outside, the longer the ON part of the cycle will be.



The MPC constantly checks the outside temperature by means of a solid state sensor (A) located on the exterior of the building. At the same time it also monitors the heating system of the building by means of a heating system sensor (B). This heating system sensor is located where it will show that heat has reached to the furthest location in the building (or the hardest to heat area). On the basis of this combined data, the MPC sends instructions (C) to the heating plant to control the heat level in the building.

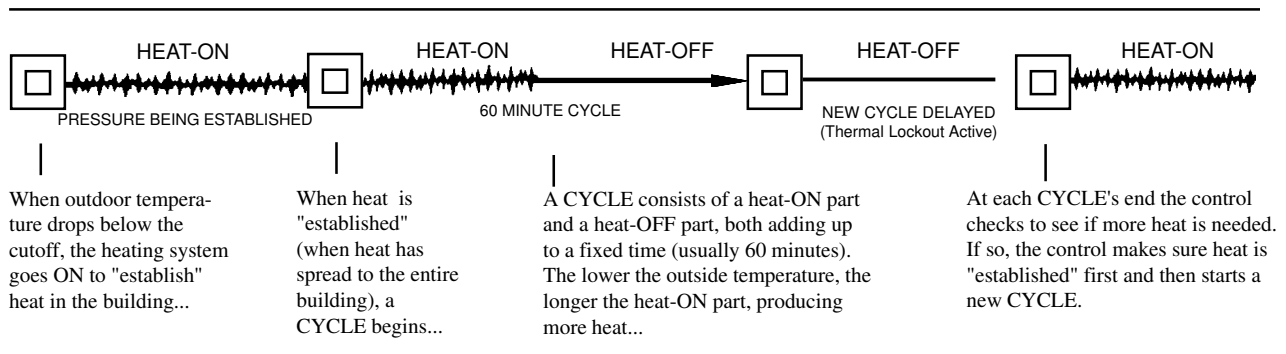
In addition to adjusting the length of the ON part of a cycle, the outdoor temperature acts as a system cutoff. When the outdoor temperature rises above an adjustable cutoff temperature, the MPC will not call for any heat. When the outdoor temperature drops below the cutoff, the MPC will automatically begin controlling the heating system cycles. Once the heating system has been activated, the heating system sensor will register when heat has reached throughout the building. The combined effect of these two sensors is to provide an even, comfortable level of heat throughout the building.



The MPC is able to maintain two different heat levels. The Day heat level is the higher level of heat that provides comfortable temperatures when the building is occupied or tenants are active. The Night heat level is lower, and can be used to conserve energy when the building is empty or when tenants are asleep. Both heat levels rely on the identical cycle concept, but the lower Night settings provide less heat given the same outdoor temperature.

SEQUENCE OF OPERATION

- The MPC activates the steam source when the outside temperature falls below the outdoor sensor cutoff (factory set at 55°F for Day and 40°F for Night, but fully adjustable).
- The MPC will continue to call for heat, keeping the steam source active, until the heating system sensor reaches its adjustable Set Point. This indicates that steam has gotten entirely through the system, or that "heat is established".
- Once "heat is established", the heat-ON segment of the cycle will begin.
- During the ON part of the cycle, the MPC will keep the steam source activated. The length of the ON part of the cycle is dependent on the outdoor temperature, the Day/Night setting, and several user selectable adjustments that can be tuned to the specific heat loss characteristics of the building.
- Once the ON part of the cycle has ended, the heat-OFF part of the cycle will begin. The MPC will turn off the boiler or close the steam valve for the remainder of this cycle.
- When the OFF part of the cycle is over, the MPC will once again activate the steam source unless either the outside temperature has risen above the set point, or the thermal lockout is active.
- With the thermal lockout, the heating system sensor temperature must fall through an adjustable differential before the heating source can be reactivated. This allows residual heat in the pipes to continue to heat the building. Once the pipes have cooled sufficiently, a new cycle can begin.



TYPICAL STEAM HEAT CONFIGURATIONS

The MPC will work with virtually any non-vacuum steam heated system. The MPC can control a boiler directly to create steam. For systems where a central plant provides steam, the MPC opens or closes a motorized valve, to allow or prevent steam from entering the heating system. The MPC will also work with one or two-pipe steam systems.

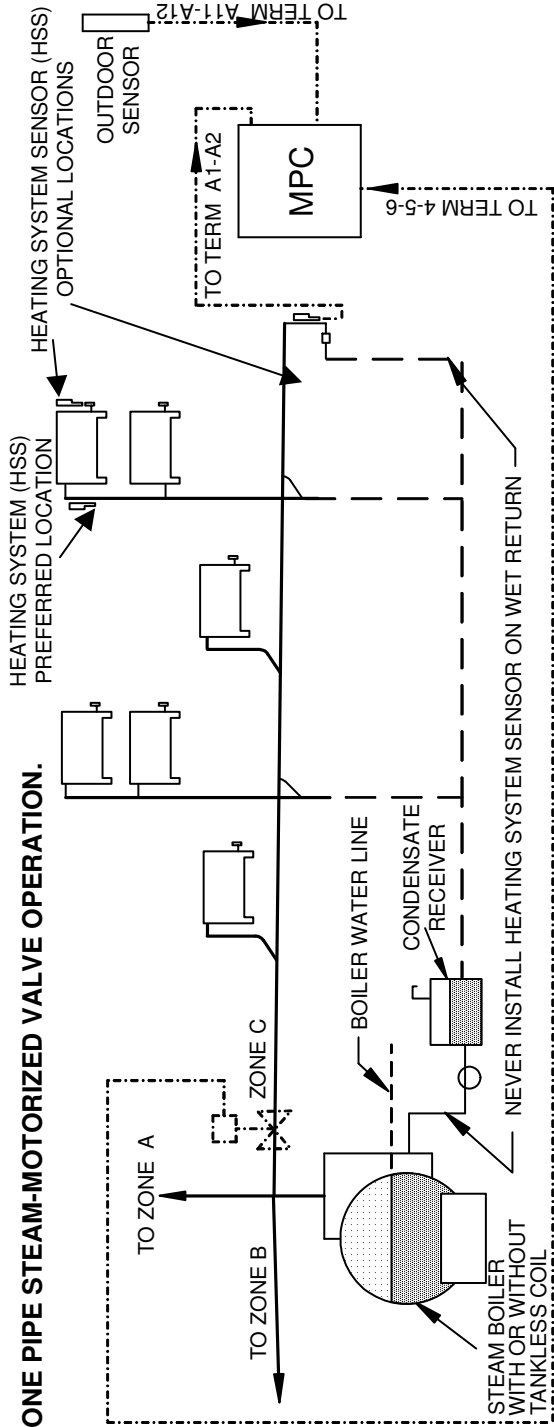
However, there are several differences in locating the heating system sensor and in the output wiring to the boiler or motorized valve which must be observed based upon the specific layout of your steam heating system. It is important to carefully check the piping diagrams on the next two pages to determine which of the following four layouts matches your heating system:

- One Pipe Steam - Motorized Valve
- Two Pipe Steam - Motorized Valve
- One Pipe Steam - Direct Burner Operation
- Two Pipe Steam - Direct Burner Operation

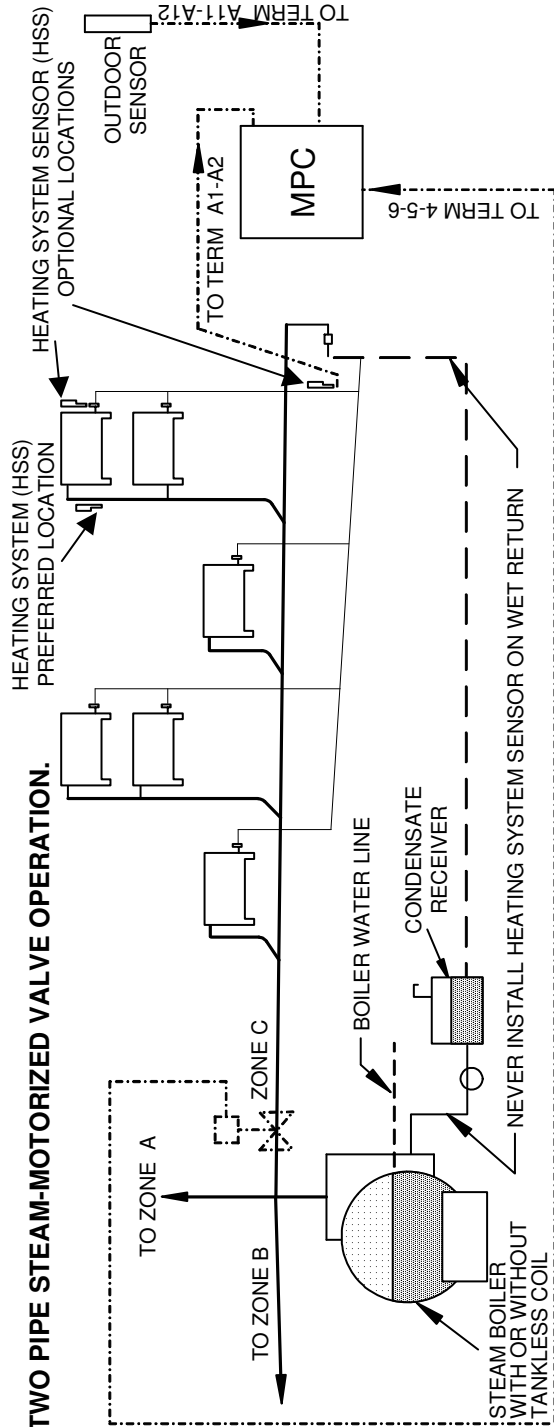
For vacuum type steam systems, see Heat-Timer SRC Control.

MPC Installation Guidelines for Motorized Valve Operation

ONE PIPE STEAM-MOTORIZED VALVE OPERATION.

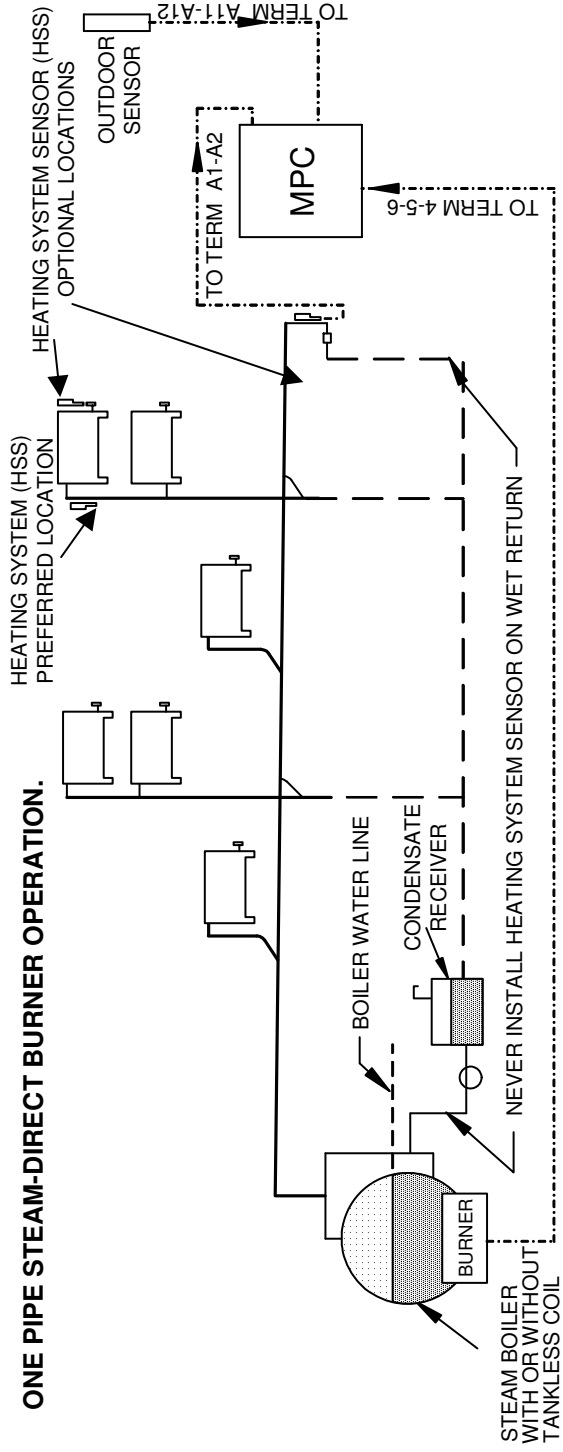


TWO PIPE STEAM-MOTORIZED VALVE OPERATION.

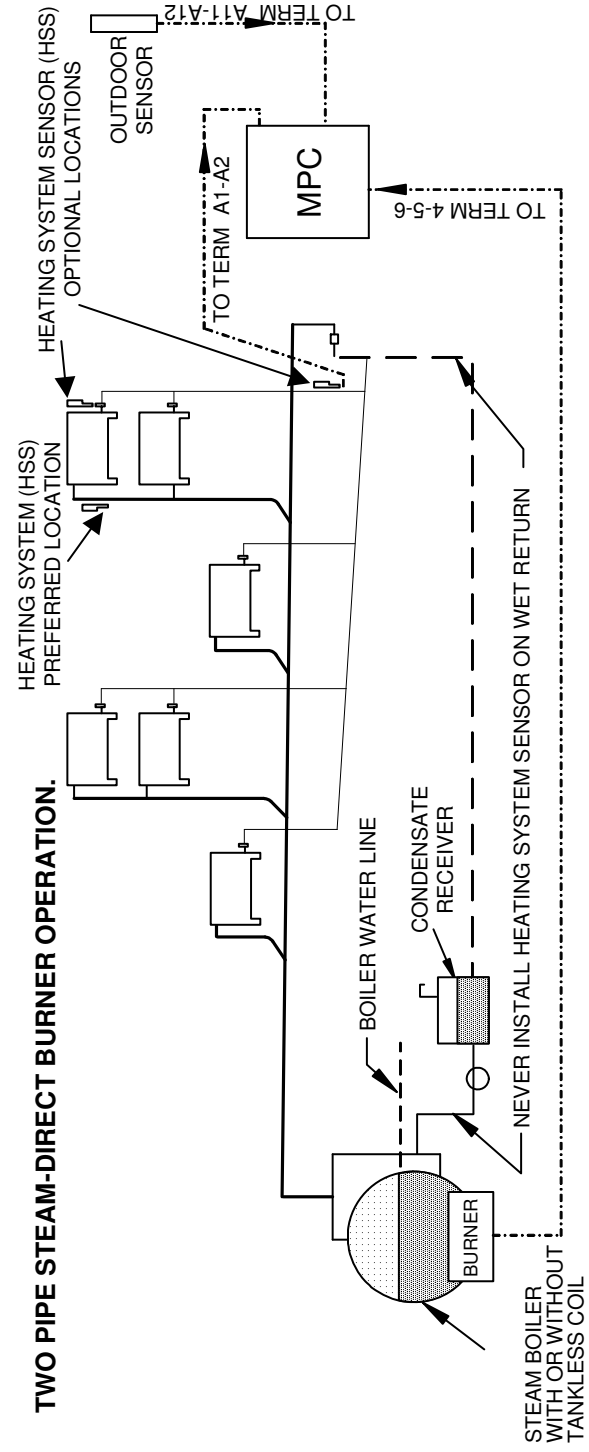


MPC Installation Guideline for Direct Burner Operation

ONE PIPE STEAM-DIRECT BURNER OPERATION.



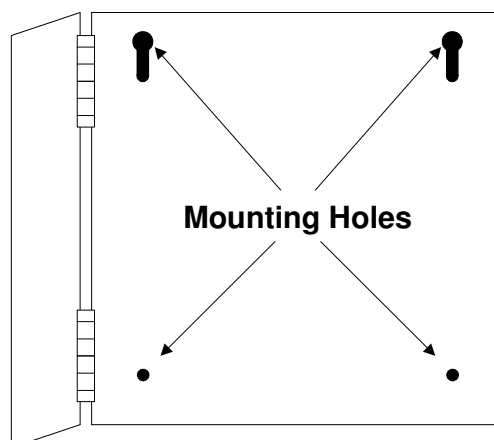
TWO PIPE STEAM-DIRECT BURNER OPERATION.



INSTALLATION

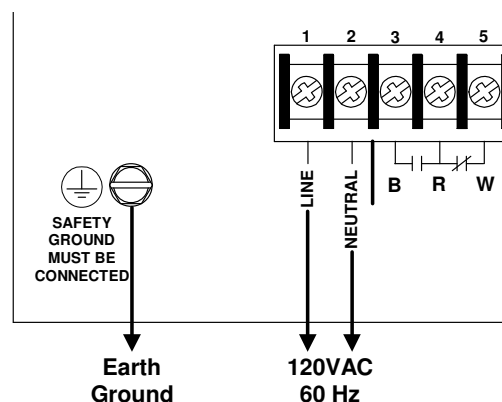
MOUNTING THE ENCLOSURE

- Select a location near the equipment to be controlled.
- The surface should be flat, and be sufficiently wide and strong to hold the MPC.
- Keep the MPC control away from extreme heat, cold, or humidity. Ambient operating temperature is from 20 to 120°F.
- Remove the control from the metal enclosure by removing the top center screw and loosening the two bottom screws. Lift the control out.
- Screw the enclosure to the surface through the mounting holes in the back of the enclosure.
- Return the control to the enclosure, replace the top screw, and tighten the bottom two screws.



WIRING THE POWER

- If possible, provide a dedicated circuit breaker for the MPC. **DO NOT** connect the MPC on a circuit breaker connected to high inductance devices such as relays, contactors, pumps, fans, or motors.
- Bring the 120VAC 60Hz power wires through a bottom Knockout (KO) of the enclosure. The left front KO is preferred.
- Class 1 voltages must enter the enclosure through a different opening from any Class 2 voltage wiring.
- Connect the hot line to terminal marked *LINE*.
- Connect the neutral line to the terminal marked *NEUT*. **DO NOT** share neutrals, the neutral line **MUST** come directly from the circuit breaker.
- The green ground screw **MUST** be connected to earth ground. **DO NOT** use the neutral line as earth ground.
- Heat-Timer recommends the installation of a Surge Suppressor and a Power Switch before the Power Line connection for safety and ease of service.



SETTING THE AUTO/BYPASS SWITCH

- The switch must be in the *AUTO* position for the MPC to control the heating system.
- The *BYPASS* position will override all automatic control of the MPC.
- If the MPC has power and is operational, switching to *BYPASS* will automatically activate the Motorized Valve, the Burner, and the System output.
- If the MPC does not have power, or is damaged, switching to *BYPASS* will manually activate the Motorized Valve output by connecting *B* and *R* (terminals 4 and 5) and manually activate the Burner by connecting the BURNER terminals (7 and 8).



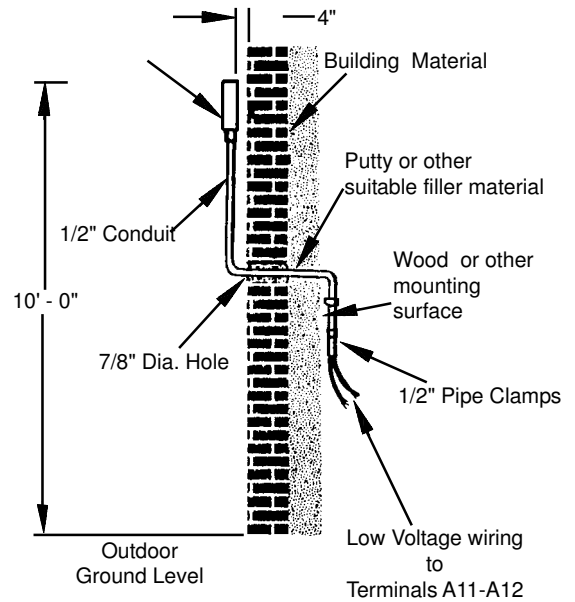
CAUTION: Switching the MPC into Bypass overrides all automatic operation. In Bypass, the boiler will run constantly on its own limits or the valve will be fully open.

INPUT WIRING

INSTALLING THE OUTDOOR SENSOR

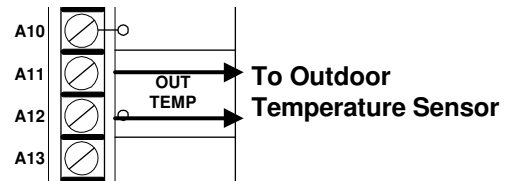
- Only use the Heat-Timer Outdoor sensor included with the MPC Platinum (#904025).
NOTE: Gold and Platinum Series MPC units use the same sensor. If you are replacing a non-Gold model Heat-Timer, the sensor must be upgraded.
- Locate the sensor in the shade on the north side of the building. The sensor should never be in direct sunlight.
- Be sure the location is away from doors, windows, exhaust fans, vents, or other possible heat sources.
- The sensor should be mounted at least 4 inches away from the building wall and approximately 10 feet above ground level

CAUTION: Determining the proper location for the Outdoor sensor is very important. The MPC will provide heat based on the outdoor temperature information it receives from this location. If the sensor is in the sun, or covered with ice, it's reading will be different from the actual outdoor temperature and heat may be erratic.



WIRING THE OUTDOOR SENSOR

- Sensor wires can be extended up to 500' by splicing with 18 gauge shielded wire (Belden #8760 or equivalent).
- Do not run sensor wire in conduit with line voltage.
- The sensor has no polarity. Connect the wires from the sensor to the MPC terminals marked *OUT TEMP* (terminals *A11* and *A12*).
- Connect the shield to the circled terminal *OUT TEMP-A12* with one of the sensor wires.



INSTALLING THE HEATING SYSTEM SENSOR (HSS)

Locating the HSS

- The ideal location for the HSS is on the last radiator in the system to get warm. This radiator is usually the one with the furthest piping distance from the boiler.
- With a one or two-pipe system, the sensor may also be located high up on the furthest supply riser (see diagrams pg. 5 and 6)
- With a two-pipe system, the sensor may be located on the furthest return riser. *However, the sensor MUST be above the water line of the boiler (on a dry return).*
- **NEVER** install the sensor between a condensate receiver and the boiler.

CAUTION: If the HSS cannot sense the system is full of steam, the MPC will not provide comfortable heat levels. Be sure the HSS is located on a properly vented pipe that cannot easily be isolated from the system.

HSS Alternative Replacement

- If replacing an existing MPC Gold series that has used a pressure switch instead of the System Sensor, a System Temperature Sensor must be installed to replace the Pressure Switch.

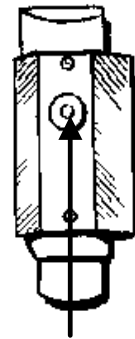
WARNING

The MPC Platinum requires a Temperature Heating System Sensor to function. Connecting a Pressure Switch will cause the MPC to indicate System Sensor Error.

Installing the HSS

- Only use the Heat-Timer HSS included with the MPC Platinum.
NOTE: Gold and Platinum Series MPC units use the same sensor.
If you are replacing a non-Gold model Heat-Timer, the sensor must be upgraded.
- Strap the HSS to the pipe with the pipe clamp provided.

Heating System Sensor (HSS)



Heat Sensing Element



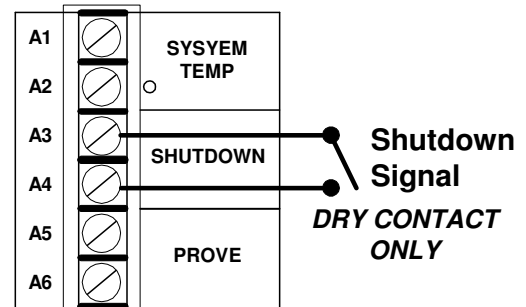
Strap sensor to pipe, firmly pressing the sensing element onto the pipe surface

WIRING THE HSS

- Sensor wires can be extended up to 500' by splicing with 18 gauge shielded wire (Belden #8760 or equivalent).
- Do not run sensor wire in conduit with line voltage.
- The sensor has no polarity. Connect the wires from the sensor to the MPC terminals marked *SYSTEM TEMP* (terminals *A1 AND A2*).
- Connect the shield to the circled terminal *SYSTEM TEMP-A2* with one of the sensor wires.

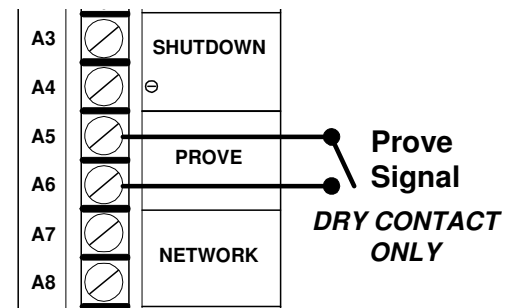
WIRING THE SHUTDOWN

- This feature can be used whenever it is desirable to turn off the MPC from a remote location or another controller.
- A typical use for this feature would be to disable all heat when an Energy Management System (EMS) indicates a building is overheated.
- When the Shutdown feature is enabled by closing a dry contact, the Burner and Motorized Valve (*OUTPUT*) relays will de-energize, turning off the boiler or closing the motorized valve. The *SYSTEM* relay will continue to be energized for the period of the System Run-On (see pg. 22).
- The Shutdown signal must be a dry contact only. No voltage can be placed across the *SHUTDOWN* terminals.
- Bring the two wires from the dry contact to the terminals marked *SHUTDOWN-A3, A4*.



WIRING THE PROVE

- The Prove feature checks system components are operational before activating the boiler or opening the motorized valve.
- If the *PROVE* input terminals are open, the MPC will enable only the System relay. The Burner and Motorized valve (*OUTPUT*) relays will be de-energized when the *PROVE* input is open.
- The Prove signal must be a dry contact only. No voltage can be placed across the *PROVE* terminals.
- Bring the two wires from the dry contact to the terminals marked *A5 and A6*.



WARNING:

The *PROVE* input cannot be used as a safety limit. All equipment must have its own certified limit and safety controls as required by local codes. Any safety interlock **MUST** be wired back to the boilers or other equipment required by code.

CAUTION: The *PROVE* input terminals must be shorted for MPC to provide heat. **DO NOT** remove the factory installed *PROVE* jumper unless replacing it with a Prove signal.

NETWORK AND AUX TEMP

- Sensors and Switches connected to these inputs can only be configured through a Heat-Timer Remote Communications package.
- Adding any of the communication packages (RI (Remote Interface RS232), RIM (Remote Interface with Dialup Modem), or RINet (Internet Communication using a browser) will provide the access to viewing and using Space saving lockout feature. and other sensor and control monitoring and alarming.

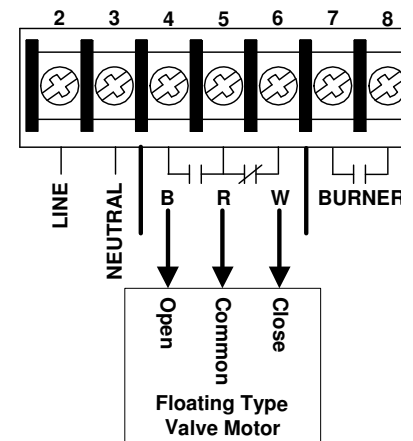
AUX INPUT

- If the boiler can be activated by other controls, i.e. domestic hot water aquastat, the Aux Input will allow a Heat-Timer communication package to chart a time line for boiler status.

OUTPUT WIRING

WIRING TO A MOTORIZED VALVE

- The terminal marked *R*, output terminal 5, is Common (C.).
- The terminal marked *B*, output terminal 4, is Normally Open (N.O.).
- The terminal marked *W*, output terminal 6, is Normally Closed (N.C.)
- The N.O. and N.C. connections are dry contacts only. They do not source any power.
- The contacts can switch 6A resistive at 120VAC.
- The total of all outputs cannot exceed 15A.



WIRING TO A BOILER

- The *BURNER* output (terminals 7 and 8), are dry contacts only.
- They are wired in series in the boiler limit circuit.
- The contacts can switch 6A resistive at 120VAC.
- The total of all outputs cannot exceed 15A.

WARNING:

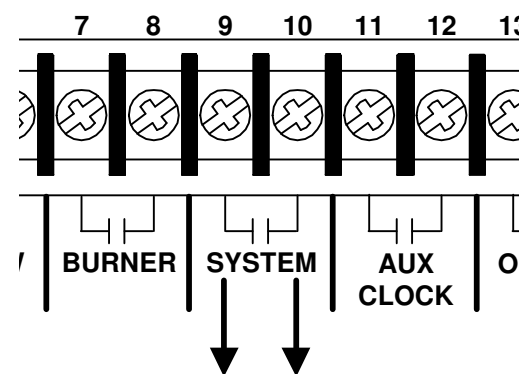
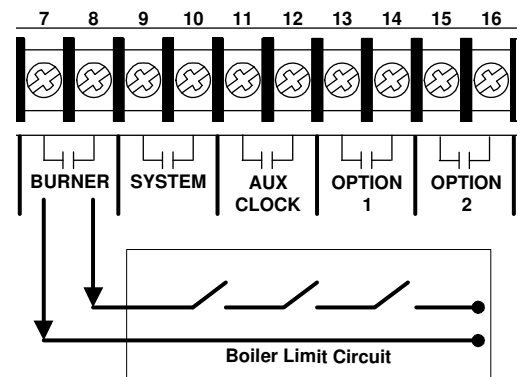
The MPC is an operating control only. The boiler must have all safety and limit controls required by code. It is the responsibility of the installer to verify that all the safety and limits are working properly before the MPC is installed.

WIRING THE SYSTEM

- The System relay will energize whenever the MPC requires steam and the Shutdown feature is not active.
- The System relay can be used to activate any equipment that should be running when the boiler is running or when the motorized steam valve is open.
- After the ON part of the cycle is over, the System relay will remain energized for the period of time set by the System Run-On (see pg. 22).
- The *SYSTEM* terminals, output terminals 9 and 10, are dry contacts only. They do not source any power.
- The contacts can switch 6A resistive at 120VAC.
- The total of all outputs cannot exceed 15A.

WIRING THE AUX CLOCK

- The Aux Clock relay is a separate time clock provided for convenience. The Aux Clock relay will energize and de-energize based on time settings (see pg. 27) independent from the heating cycles.
- The Aux Clock can be used to turn on and off any equipment. For instance, the Aux Clock could be programmed to automatically turn on boiler room lights in the evening and turn them off in the morning.
- The *AUX CLOCK* terminals, output terminals 11 and 12, are dry contacts only.



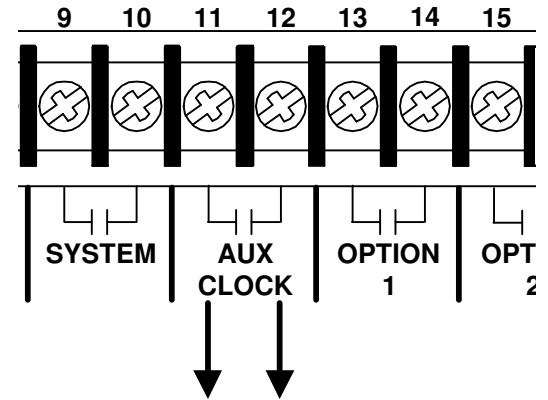
N.O. contacts are wired in series with equipment that should be ON when steam is required

They do not source any power.

- The contacts can switch 6A resistive at 120VAC.
- The total of all outputs cannot exceed 15A.

WIRING THE OPTION RELAYS

- The Option relays can be programmed during Startup to energize or de-energize based on specific criteria.
- Option 1 can be programmed to energize based on any of the following: Inverse of the Aux Clock signal, Day, or when the outdoor temperature is below the Outdoor Cutoff.
- Option 2 can be programmed to energize based on any of the following: Inverse of the Output relay, Heat Established, or when the MPC is switched to Summer.
- Option 3 can be programmed to energize on any of the following: Inverse of the System relay, Night, or when the outdoor temperature is above the Outdoor Cutoff.
- These Option relays can be used to provide status information to an EMS, or to turn on and off any equipment that should operate only at specific times, during specific weather conditions, or during specific parts of the heating cycle.
- Each Option has a pair on contacts:
OPTION 1 - 13 and 14
OPTION 2 - 15 and 16
OPTION 3 - 17 and 18
- They are dry contacts only. They do not source any power.
- The contacts can switch 6A resistive at 120VAC.
- The total of all outputs cannot exceed 15A.



N.O. contacts are wired in series with equipment that should be ON based on time

USING THE MENUS

MENU TYPES

Shift - allow you to temporarily shift from the Day (higher heat level) to Night (lower heat level) settings, or vice versa, without reprogramming the times of the Day/Night Schedule

System Settings - determine how the system will operate. These are general settings that control how much heat will be provided. The default settings will generally work in most applications, but adjustments should be made to fine-tune the performance of your system.

Schedules - Sets the Day/Night heat schedule and the Aux clock schedule. Four pairs of Day/Night shifts can be set for each day of the week. In addition, the Aux relay can be programmed to turn on or off up to eight times per day.

Maintenance Settings - Provide calibration for the sensors and allow a password to be set.

System Startup Settings - determines the type of system. It controls the temperature display (°F or °C), operation mode, cycle length, and the function of the Option relays. If the Startup Settings are not correct, the MPC cannot operate the system correctly.

MENU BASICS

- The menus are in English and will guide you through the settings.
- To change a selection, rotate the black knob marked *ADJUST* and *PRESS TO SELECT (ADJUST/SELECT)*. Rotating the knob clockwise will move down the list of possible selections. Rotating the knob counterclockwise will move up the list.
- A pointer in front of a menu line indicates that it is the one currently selected.
- When the pointer is on the same line as the item to be selected, press the black *ADJUST/SELECT* knob. This will either save the selection, or bring up a new screen to make further changes to that menu item.
- The *BACK* button will return you to the previous screen without saving any changes made.

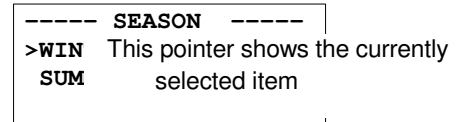
CHANGING SETTINGS


- Some settings require a number, such as time, temperature, or reset ratio to be adjusted.
- These screens will be indicated with the title on top and then the current numerical value for that setting.
- To change a selection, rotate the *ADJUST/SELECT* knob. Rotating the knob will cause a pointer to appear. Both the old and new value will be displayed.
- The *BACK* button will return you to the previous screen without saving any changes made.
- When the new value (the one being pointed to) is correct, press the *ADJUST/SELECT* knob. This will save the selection to memory and return you to the previous menu.

SYSTEM STARTUP STARTUP SEQUENCE

- The series of initialization screens appears on the left. The MPC will automatically step through the screens.
- When powered, the MPC performs a self-test on its components.
- After the self-test diagnostics have been successfully completed, the MPC will initialize the control.
- On the first power up, the *System Startup* screen will appear after the initialization is complete. If it doesn't, the MPC has already been configured. If you wish to review or adjust any settings, follow the procedure on pg. 29.
- Press the *ADJUST/SELECT* knob once to begin setting up the control.

MAKING SELECTIONS



 The **BACK** button returns to a previous menu without changing the selection



Pressing

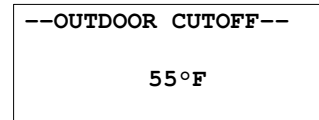
The **ADJUST/SELECT** knob saves the selection to memory and returns to a previous menu




Rotating

The **ADJUST/SELECT** knob moves the pointer up and down selections

CHANGING VALUES



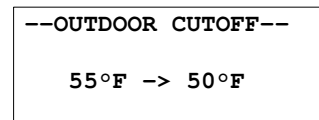
The Outdoor Cutoff is currently 55°F

 The **BACK** button returns to a previous menu without changing the value



Rotating

The **ADJUST/SELECT** knob changes the value - this is indicated by a pointer from the old value to a new value




The screen shows the old and new value



Pressing

The **ADJUST/SELECT** knob saves the new value (50°F) to memory and returns to a previous menu

 The **BACK** button returns to a previous menu without changing the value


SETTING THE TEMPERATURE DISPLAY MODE DEFAULT - °F

- This selection allows you to set the display mode of the sensors and all temperature settings displayed by the MPC.
- If °F is selected, all temperatures and settings will be displayed in degrees Fahrenheit.
- If °C is selected, all temperatures and settings will be displayed in degrees Celsius.

```
-- SENSOR TYPE --
>°F Sensor
°C Sensor
```

ADJUST  Press to select °F
PRESS TO SELECT

```
-- SENSOR TYPE --
°F Sensor
>°C Sensor
```

ADJUST  or turn to scroll down
PRESS TO SELECT

```
-- SENSOR TYPE --
°F Sensor
>°C Sensor
```

ADJUST  Press to select new
PRESS TO SELECT

SELECTING THE OPERATION MODE DEFAULT - BURNER OR VALVE

- In most buildings, the amount of time it will take for the heating system to fill with steam depends on several factors. For example, with direct burner operation, the amount of time it takes to generate steam will depend on how long the boiler was off since the last call for heat. With a valve, the amount of time will also depend on the status of the heating plant and may additionally vary depending on how many other valves are currently open and calling for steam.
- However, in the case where steam is distributed from a local power authority (district steam) or other source where the steam is always available at a constant pressure, the time it will take to fill the heating system with steam will be relatively constant.
- If your steam source is of the later type, you may decide to select the District Steam option.
- With the District Steam option, the HSS is not used. A timer is used to determine when Heat is Established and the ON part of the cycle will begin.
- Selecting the District Steam option may result in overheating and unnecessary energy expenditure, as the Thermal Lockout feature (see pg. 22) will not be available.

```
- OPERATION MODE -
>Burner or Valve
District Steam
```

ADJUST  Press to select B or V
PRESS TO SELECT

```
- OPERATION MODE -
Burner or Valve
>District Steam
```

ADJUST  or turn to scroll down
PRESS TO SELECT

```
- OPERATION MODE -
Burner or Valve
>District Steam
```

ADJUST  Press to select new
PRESS TO SELECT

SELECTING THE CYCLE LENGTH DEFAULT - 60

- With most cast iron radiation, choose a 60 minute cycle. If the radiators are very large or the system is oversized, choose a 90 minute cycle.
- For convector or baseboard radiation, choose a 30 minute cycle.
- For air handlers or blower units, choose a 20 minute cycle.
- The cycle length can be adjusted from 10 to 240 minutes, but it is recommended to start with the guidelines above.

```
-- CYCLE LENGTH --
60 Min -> 60 Min
[--- ]
```

ADJUST  Press to select 60
PRESS TO SELECT

```
-- CYCLE LENGTH --
60 Min -> 90 Min
[----- ]
```

ADJUST  or turn to adjust
PRESS TO SELECT


```
-- CYCLE LENGTH --
60 Min -> 90 Min
[----- ]
```

ADJUST  Press to select new
PRESS TO SELECT

-- SENSOR FAULT --
>Output On
Output Off

ADJUST
 Press to
PRESS TO SELECT
select
On

-- SENSOR FAULT --
Output On
>Output Off

ADJUST
 or turn
PRESS TO SELECT
to adjust


-- SENSOR FAULT --
Output On
>Output Off

ADJUST
 Press to
PRESS TO SELECT
select
Off

-DAY LIGHT SAVING-
>Enable
Disable

ADJUST
 Press to
PRESS TO SELECT
select
Enable

-DAY LIGHT SAVING-
Enable
>Disable

ADJUST
 or turn
PRESS TO SELECT
to adjust


-DAY LIGHT SAVING-
Enable
>Disable

ADJUST
 Press to
PRESS TO SELECT
select
Disable

OPTION RELAY 1 MODE
>Off
Inverse of Aux
Day

ADJUST
 Press to
PRESS TO SELECT
select
Off

OPTION RELAY 1 MODE
>Off
Inverse of Aux
Day
Below Outdoor Cut

ADJUST
 or turn
PRESS TO SELECT
to adjust


OPTION RELAY 1 MODE
Inverse of Aux
>Day
Below Outdoor Cut

ADJUST
 Press to
PRESS TO SELECT
select
new

OPTION RELAY 2 MODE
>Off
Inverse of Output
Heat Established

ADJUST
 Press to
PRESS TO SELECT
select
Off

OPTION RELAY 2 MODE
Off
>Inverse of Output
Heat Established
Summer

ADJUST
 or turn
PRESS TO SELECT
to adjust

OPTION RELAY 2 MODE
Inverse of Output
Heat Established
>Summer

ADJUST
 Press to
PRESS TO SELECT
select
new

SELECTING SENSOR FAULT DEFAULT - ON

- In the case the MPC can no longer read the Outdoor sensor, you can select whether you want to default to providing continuous heat, or no heat at all.
- Although unusual, the MPC might lose the Outdoor sensor reading for a variety of reasons, including the sensor wires being cut, the sensor being vandalized, the sensor wires becoming shorted, or a fault in the sensor.
- To help prevent a freeze-up in such a circumstance, the MPC can be programmed to run the boiler or maintain the valve open, thereby providing continuous heat until the sensor problem can be corrected. Select *Output On*.
- If *Output Off* is selected, the MPC will not provide any heat if the sensor should register a fault.

SELECTING THE DAY LIGHT SAVING MODE DEFAULT - ENABLE

- If it is desirable for the MPC to automatically adjust the system clock for Day Light savings, select *Enable*.
- If the control is located where Day Light Savings time is not observed, or if you wish to manually change the clock for Day Light Savings, select *Disable*.

SELECTING THE OPTION 1 RELAY MODE DEFAULT - OFF

- The status of Output Relay 1 can be programmed to energize or de-energize based on four different criteria.
- If the default "*Off*" setting is selected, the Option 1 Relay will never energize.
- If the "*Inverse of Aux*" is selected, the Option 1 Relay will be energized whenever the Aux Clock relay is de-energized and the Option 1 Relay will be de-energized whenever the Aux Clock relay is energized.
- If "*Day*" is selected, the Option 1 Relay will be energized whenever the MPC is holding the higher, or Day, heat settings. The Option 1 Relay will be de-energized when the MPC is holding the lower, or Night settings.
- If "*Below Outdoor Cutoff*" is selected, the Option 1 Relay will be energized whenever the Outdoor sensor temperature registers below the Outdoor Cutoff temperature. The Option 1 Relay will be de-energized whenever the Outdoor sensor temperature registers above the Outdoor Cutoff.

SELECTING THE OPTION 2 RELAY MODE DEFAULT - OFF


- The status of Output Relay 2 can be programmed to energize or de-energize based on four different criteria.
- If the default "*Off*" setting is selected, the Option 2 relay will never energize.

- If the "Inverse of Output" is selected, the Option 2 Relay will be energized whenever the Output relays are de-energized and the Option 2 Relay will be de-energized whenever the Output relays are energized.
- If "Heat Established" is selected, the Option 2 Relay will be energized whenever the MPC has established heat (the temperature of the HSS is above the System Set Point). The Option 2 relay will be de-energized when the MPC has not established heat.
- If "Summer" is selected, the Option 2 Relay will be energized whenever the MPC is switched to the Summer mode (no heat is provided). The Option 2 relay will be de-energized whenever the MPC is in Winter.

OPTION RELAY 3 MODE
 >Off
 Inverse of System
 Night

ADJUST
 Press to
 select
 Off

OPTION RELAY 3 MODE
 Off
 >Inverse of System
 Night
 Above Outdoor Cut

ADJUST
 or turn
 to adjust

OPTION RELAY 3 MODE
 Inverse of System
 Night
 >Above Outdoor Cut

ADJUST
 Press to
 select
 new

SELECTING THE OPTION 3 RELAY MODE DEFAULT - OFF

- If the MPC Platinum has an Internet communication option, Option 3 Relay will not be available for programming. The relay output will be used to energize the Internet Modem/Router.
- The status of Output Relay 3 can be programmed to energize or de-energize based on four different criteria.
- If the default "Off" setting is selected, the Option 3 relay will never energize.
- If the "Inverse of System" is selected, the Option 3 Relay will be energized whenever the System relay is de-energized and the Option 3 relay will be de-energized whenever the System relay is energized.
- If "Night" is selected, the Option 3 Relay will be energized whenever the MPC is holding the lower, or Night, heat settings. The Option 3 Relay will be de-energized when the MPC is holding the Day settings.
- If "Above Outdoor Cutoff" is selected, the Option 3 Relay will be energized whenever the Outdoor sensor temperature registers above the Outdoor Cutoff temperature. The Option 3 Relay will be de-energized whenever the Outdoor sensor temperature registers below the Outdoor Cutoff.

This completes the System Startup process. Please the SELECT button to bring up the main screen.

THE MAIN DISPLAY

- The main display continuously shows all the information required to see how the control is operating the heating system.

First Line - The date and time of day are displayed. The time of day is an important control parameter as it determines when, and how much, heat the building will receive. After the time, *Am* or *Pm* is shown. Erratic heating problems can be caused if *Am* or *Pm* settings are not correct (to set the time, see pg. 24).

Second Line - This line shows the heating status of the MPC. A brief description of display follows:

Summer - The MPC is switched to the Summer mode. No heat will be provided, regardless of outdoor temperature.

Shutdown - The Shutdown input is closed. No heat will be provided, regardless of outdoor temperature.

No Call for Heat - The MPC is not providing heat because the outdoor temperature is above the Outdoor Cutoff.

Est Heat at ___°F - The MPC has activated the heating system to Establish Heat. When the HSS reaches the temperature displayed, the ON part of the cycle will begin.

Cycle On: /_ Min - The ON part of the cycle has begun. The first number shows the number of minutes since Heat Established, and the second number shows the total length of the ON part of the cycle.

Cycle Off: /_ Min - The ON part of the cycle is over, and the OFF part has begun. The first number shows the number of minutes into the complete cycle and the second number shows the total cycle length.

Thermal L/O ___°F - The MPC is in Thermal Lockout. Once the HSS temperature drops below the temperature displayed, the cycle will start again given there is a call for heat.

Third Line - The third line displays, on the left, the Outdoor Cutoff temperature, below which the MPC gives heat. On the right is displayed whether the MPC is maintaining the higher, *Day*, settings, or the lower, *Night*, settings.

Fourth Line - This shows the current temperature being read by the Outdoor sensor, on the left, and the HSS, on the right. If either sensor has a fault, this will be indicated by a flashing reading of either OPEN for an open circuit or SHORT for a shorted circuit.

- SYSTEM STARTUP -
Completed
SELECT to continue



*Press to
select*

DATE	TIME
Cutoff	Day/Night
Out Temp	Sys Temp

OPERATION

SYSTEM SETTINGS

SEASON

- The Season setting controls whether the MPC will give heat.
- The MPC will not call for heat when switched to *Summer*.
- When switched to *Winter*, the MPC will call for heat whenever the outdoor temperature falls below the Cutoff temperature (see pg. 18).
- During the heating season, the control should be in the Winter mode.
- When the heating season is over, it is a good practice to switch the MPC to the Summer mode.

CAUTION: Do not turn the power off to the MPC when the heating season is over. If you do so, the battery will run down and have to be replaced. Instead, switch to the Summer mode.

HEAT ADJUSTMENT

- The Heat Adjustment settings control the amount of heat given based on outdoor temperature.
- An A setting gives the least amount of heat at any given outside temperature, and a P setting gives the most heat (see Cycle Chart Example pg. 19).
- The MPC has two heat levels, Day and Night. The Day level is set for times when the building is occupied and people are active. The Night level holds a lower ambient temperature, and is for when the building is unoccupied, or people are sleeping.
- The Day and Night Heat Adjust settings can be individually set.
- The length of the ON part of the cycle is based on the Outdoor Cutoff temperature (see pg. 18). Therefore, if you set both the Day and Night Heat Adjustments to the same value, you will get less heat at Night. For example, with both Heat Adjustments set to F and the factory set Cutoffs of 55°F for Day and 40°F for Night, when the outdoor temperature is 25°F the On part of the cycle will last for 15 minutes in Day, and only 7 minutes at Night
- A good starting point for both Heat Adjustment settings is F.
- If the building is too cold in cold weather, adjust the appropriate setting (Day if it is too cold in the Day program, and Night if it is too cold in the Night program) up a letter. That is, from F to G. Then wait at least 24 hours before evaluating if the adjustment was sufficient.
- Similarly, if it is too hot in the cold weather, reduce the Heat Adjustment one letter and wait.

```
DATE          TIME
CYCLE STATUS
Cutoff      Day/Night
Out Temp    Sys Temp
```



Press to see menus

```
---- SETTINGS ----
>Shift
<System Settings>
<Schedules>
```



Turn to adjust

```
---- SETTINGS ----
Shift
><System Settings>
<Schedules>
```



Press to select System

```
- SYSTEM SETTINGS -
>Season
Day Heat Adjust
Night Heat Adjust
```



Press to select Season

```
----- SEASON -----
>Winter
Summer
```



Press to select Winter

```
----- SEASON -----
Winter
>Summer
```



or turn to adjust

```
- SYSTEM SETTINGS -
>Season
Day Heat Adjust
Night Heat Adjust
```



Turn to adjust

```
- SYSTEM SETTINGS -
Season
>Day Heat Adjust
Night Heat Adjust
```



Press to select Day

```
- DAY HEAT ADJUST -
Higher=More Heat
E
[-----]
```



Turn to adjust

```
- DAY HEAT ADJUST -
Higher=More Heat
H
[-----]
```



Press to select new

OUTDOOR CUTOFF

- The Day and Night Outdoor Cutoff temperatures determine when the MPC will call for heat.
- When the outside temperature is above the Cutoff, the MPC will not call for heat.
- When the temperature falls below the Cutoff, the MPC will begin running cycles and providing steam to the heating system.
- The Cutoff temperature also affects the amount of heat provided to the building as shown in the Cycle Chart Example, pg. 19.
- The MPC comes factory set with a Day Cutoff of 55°F and a Night Cutoff of 40°F.
- The range of the Day Cutoff temperature is from 20°F to 100°F.
- The range of the Night Cutoff is from 20°F to 100°F and OFF.

SYSTEM SET POINT

- The System Set Point is used to prove that heat has gotten all the way through the building's radiation system.
- The System Set Point sets a temperature for the HSS. Above this temperature, all the radiators in the building should be receiving heat.
- The System Set Point can be set from 70°F to 250°F.
- To find the appropriate System Set Point for your building, use the following procedure:
 1. Turn the heating system off and wait until the radiators are cool when touched.
 2. Adjust the System Set Point to the maximum, 250°F.
 3. Start the heating system.
 4. Go to the furthest radiator (in terms of longest piping distance) or to a radiator in a location known to get heat last.
 5. Wait until the radiator begins to get warm. This may take up to half an hour, or even more, depending on the steam distribution in the building.
 6. Return to the MPC control and mark down the temperature of the HSS (displayed next to *SYS* on the fourth line of the main display). That temperature is the correct temperature for the System Set Point.
 7. Set the System Set Point to the temperature noted in Step 6.

CAUTION: The System Set Point must be set correctly, as described above. Otherwise, the MPC may consistently under or overheat the building, especially in mild weather when fuel savings should be the greatest.

- SYSTEM SETTINGS -
>Season
Day Heat Adjust
Night Heat Adjust



Turn to adjust

- SYSTEM SETTINGS -
Night Heat Adjust
>Day Cutoff
Night Cutoff



Press to select Cutoff

- OUTDOOR CUTOFF -
55°F
[-----]



Turn to adjust

- OUTDOOR CUTOFF -
50°F
[-----]



Press to select new

- SYSTEM SETTINGS -
Night Heat Adjust
>Day Cutoff
Night Cutoff



Turn to adjust

- SYSTEM SETTINGS -
Day Cutoff
Night Cutoff
><More Settings>



Press to select More

-SYSTEM SETTINGS 2-
>Sys Setpoint
Sys Diff
Boost Mode



Press to select Setpoint

- SYSTEM SETPOINT -
150°F
[-----]



Turn to adjust

- SYSTEM SETPOINT -
160°F
[-----]



Press to select new

SYSTEM DIFFERENTIAL (SYS DIFF)

- The System Differential is the temperature range through which the HSS must fall below the System Set Point before another cycle can begin.
- The System Differential is adjustable from 3°F to 75°F.
- The selected starting value for the System Differential depends on the value of the System Set Point. The higher the System Set Point, the higher the Differential value can be set.
- As an initial setting, the heating system should be restarted at approximately 125 °F. At this temperature most of the residual heat in the radiators has dissipated, but enough heat remains to keep the ambient temperatures warm during the time it takes the MPC to establish heat.
- For example, if the System Set Point is 170°F, then the Differential should be set to 45°F, so the Set Point less the Differential is 125°F. If the System Set Point is 140°F, then the Differential should be set to 15°F.
- If the space temperature becomes too cold between cycles, reduce the amount of the System Differential.
- If the building is overheating, especially in mild weather, first check the System Set Point (see pg. 18). If the System Set Point setting is correct, then increase the System Differential.

```
-SYSTEM SETTINGS 2-
>Sys Setpoint
Sys Diff
Boost Mode
```



Turn to
adjust

```
-SYSTEM SETTINGS 2-
Sys Setpoint
>Sys Diff
Boost Mode
```



Press to
select
Diff

```
SYSTEM SENSOR DIFF
25°F
[-----]
```



Turn to
adjust

```
SYSTEM SENSOR DIFF
20°F
[-----]
```



Press to
select
new

BOOST MODE

- The Boost is designed to quickly return the building to comfortable ambient temperatures after the cooler Night period.
- The MPC will accomplish this by either running the boiler on its limits or opening the steam valve for a given Boost time period based on the #1 Day schedule for that day (see pg. 24).
- During the Boost heat period, the MPC does not run cycles. The prolonged heat period allows ambient temperatures to rise rapidly.
- The Boost can be disabled for all days by selecting *Disable*.
- If you do not want a Boost on a specific day of the week, clear the #1 Day to **:*(see pg. 25), and use the #2 Day program for any Day settings.
- There are three types of Boost:
 1. *Manual* - This Boost begins at the #1 Day time, and lasts for a selected number of minutes. The Manual Boost time can be adjusted from 0 to 120 minutes. The Manual Boost time does not automatically adjust with outside temperature.
 2. *Vari* - This boost begins earlier than the #1 Day time. The number of minutes before the #1 Day time depends on the outside temperature and the selected Boost Adjustment Curve (see pg. 21). A Vari Boost curve of 0 gives the shortest Boost period, and a curve of 6 gives the longest Boost period. The Vari Boost has a built in self-adjusting Warm-up time. This accounts for how long it takes for the heat source to reach the System Set Point, and is added to the Boost time.
 3. *Vari +ESD* (Early ShutDown) - This Boost is typically only used in commercial or other buildings where the building is unoccupied during the Night times. The Vari Boost, described above, runs based on the #1 Day time. In addition, the MPC will switch into the Night mode earlier than the last *Night* setting for that day of the week. The warmer it is outside, the earlier the MPC

```
-SYSTEM SETTINGS 2-
>Sys Diff
Boost Mode
Sys Run-on
```



Turn to
adjust

```
-SYSTEM SETTINGS 2-
Sys Diff
>Boost Mode
Sys Run-on
```



Press to
select
Boost

```
--- BOOST MODE ---
>Disabled
Manual
Vari
Vari+ESD
```



Turn to
adjust

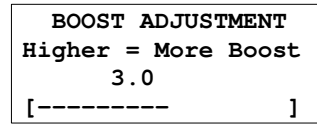
```
--- BOOST MODE ---
Manual
>Vari
Vari+ESD
```



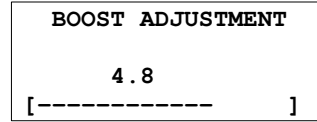
Press to
select
new

will shift into Night based on the Boost Adjustment Curve.

- The duration of the Manual Boost can be set from 0 to 120 minutes.
- The Vari Boost curves can be set from 0.1 to 6.4. The Early Shutdown curve cannot be set separately from the Vari Boost curve.



ADJUST
PRESS TO SELECT *Turn to adjust*



ADJUST
PRESS TO SELECT *Press to select new*

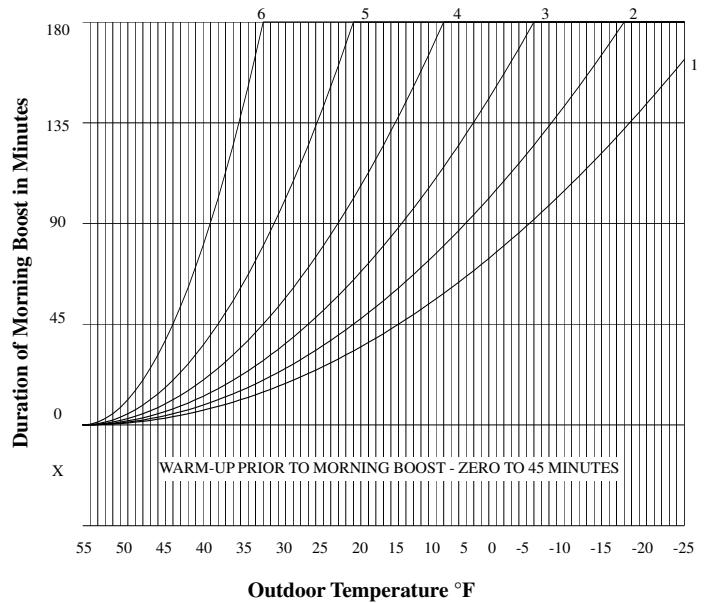
WARMUP ENABLE AND LEARN

- The Warmup Enable and Learn Features are only available with Remote Communication packages.
- 'Warmup' is an additional time added to the calculated 'Vari-Boost' period to account for the time it takes for 'Heat-Established' to be achieved. It is initialized for 15 minutes at control turn-on.
- If 'Learn' is enabled after enabling 'Warmup', the control will measure the actual time it takes to get to 'Heat-Established' at the '1d' shift. It will then take this actual time and use to calculate the 'Warmup' time to be used starting the next day.

VARI BOOST AND EARLY SHUTDOWN CURVES

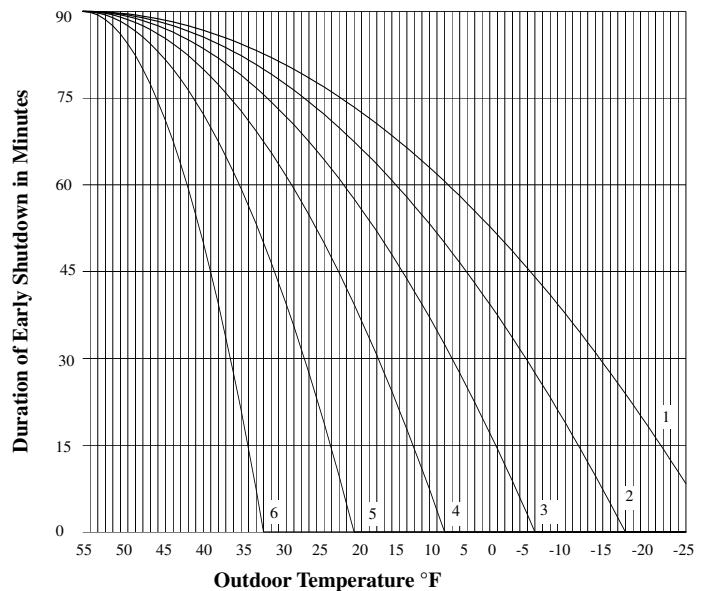
VARI BOOST CURVES

- These six curves, adjustable in tenths, determine the duration of the Boost in accordance with changes in outside temperature.
- Vari Boost time increases with colder outdoor temperatures.
- The vertical axis represents the time span from zero to 3 hours; the horizontal axis represents the outdoor temperature in degrees F.
- The Warm-up period (marked as X below 0 minutes) represents a variable period of up to 45 minutes during which time the heating system is warmed up prior to the Boost.
- The MPC determines the number of Warm-up minutes for a specific building based on a rolling average of its past experiences establishing heat for Vari Boost.
- The total Vari Boost time is equal to the time determined by the outdoor temperature and the Boost curve plus the Warm-up time.



EARLY SHUTDOWN CURVES

- The same curve setting (1 through 6) that determines the Vari Boost also determine the Early Shutdown operation, but in reverse. The curves cannot be set separately.
- Early Shutdown time decreases with colder outdoor temperatures.
- The time spans for the Early Shutdown are half as long as the Vari Boost - ranging from 0 to 90 minutes instead of 0 to 180 minutes (compare vertical axis of the two graphs).



VARI BOOST AND EARLY SHUTDOWN EXAMPLE

Settings:

Program settings: #1 Day is 6:00 AM, #1 Night is 10:00 PM, and all other settings are **:***
 Manual Boost time: 75 minutes
 Vari-Boost: Curve of 3, Warm-up-time 15 minutes
 System Set Point: 150°F

OUTDOOR TEMP	MANUAL BOOST START	MANUAL BOOST END	VARI-BOOST START	VARI-BOOST END	SHUTDOWN START	SHUTDOWN END
50 ° F	6:00 AM	7:15 AM	5:44 AM	6:00 AM	8:30 PM	10:00 PM
30 ° F	6:00 AM	7:15 AM	5:10 AM	6:00 AM	8:45 PM	10:00 PM
10 ° F	6:00 AM	7:15 AM	4:40 AM	6:00 AM	9:18 PM	10:00 PM

Operation:

- When the Manual or Vari Boost begins, the heat source will be activated.
- The HSS will reach 150°F in approximately 15 minutes. Note this 15 minutes is not added to the Manual Boost time.
- The MPC will leave the heat source activated until the Boost time ends.
- After the Boost the MPC will begin running normal Day cycles.
- With the Early Shutdown, the MPC will switch to the Night settings before the actual night setting of 10:00 PM.

SYSTEM RUN-ON (SYS RUN-ON)

- The *Sys Run-On* setting controls for how long the System relay will remain energized after the Output relays are turned off.
- In operation, this means that the System relay will remain energized for the specified number of minutes after the Output relay has de-energized.
- The System Run-On is adjustable from 0 to 360 minutes.

-SYSTEM SETTINGS 2-
 Boost Mode
 >Sys Run-on
 Thermal Lockout

ADJUST

 PRESS TO SELECT

Press to select
 Run-on

--- SYS RUN-ON ---
 10.0
 [--]

ADJUST

 PRESS TO SELECT

Turn to adjust

--- SYS RUN-ON ---
 15.0
 [---]

ADJUST

 PRESS TO SELECT

Press to select
 new

THERMAL LOCKOUT

- The Thermal Lockout prevents another cycle from starting when the heating system is still hot.
- When a cycle is over, the pipes and radiators may still be very warm and they therefore continue to heat the ambient air. If more steam were immediately added to the heating system, the ambient space would begin to overheat.
- The Thermal Lockout prevents this from occurring as it allows the system pipe temperatures to fall through the adjustable System Differential before reactivating the heat source.
- The Thermal Lockout should be selected to *On* unless the system dissipates heat very quickly, as might occur with air handling units.

-SYSTEM SETTINGS 2-
 Boost Mode
 Sys Run-on
 >Thermal Lockout

ADJUST

 PRESS TO SELECT

Press to select
 Lockout

--THERMAL LOCKOUT--
 >On
 Off

ADJUST

 PRESS TO SELECT

Turn to adjust

--THERMAL LOCKOUT--
 On
 >Off

ADJUST

 PRESS TO SELECT

Press to select
 new

SPACE LOCKOUT

- Space Lockout is a communication package feature that can be activated. It prevents another cycle from starting when the Average Space Temperature is higher than the Day or Night Space Target.
- Each space sensor has the option to be included in the Space Average Temperature or used for reference only.

-REMOTE INTERFACE-
 >Space Lock Disable
 Day Target 60 °F
 Night Target 67 °F
 Internet ID Solo

ADJUST

 PRESS TO SELECT

Press to select
 Lock

REMOTE INTERFACE

System Settings/More Settings/Remote Interface

The MPC Platinum can be controlled remotely. This allows the MPC Platinum to monitor additional sensors that can be used for monitoring and turning alarms On or Off.

```
-REMOTE INTERFACE-
>Space Lock  Disable
Day Target    60°F
Night Target  67°F
Internet ID   Solo
```

 *Press to select*
 *Lock*

The MPC Platinum using a communication package (RI, RIM, RI-Net) and a computer with Visual Gold software or internet access (for RI-Net only) can configure a large number of sensors that can be used either in calculating the heat required or for monitoring several building and equipment functions. Using this feature allows for setting of alarms, warnings and analysis.

GATEWAY

Serial 485, None, 1 through 21

Default: None

System Settings/More Settings/Remote Interface/Gateway Address

When connecting to the MPC Platinum using an RI (Remote Interface) or RIM (Modem) a Gateway option will be present on the Remote Interface menu list. The Gateway is to configure the connection to the MPC Platinum using a direct cable connection (RS232 or RS485 Cables) or a modem connection by dialing into the MPC Platinum RIM through a modem.

```
--GATEWAY ADDRESS--
Serial 485
>NONE
1 - 21
```

 *Press to select*
 *Lock*

When connecting multiple MPC Platins to a Heat-Timer TGC Gateway, the numbers 1 through 21 will be used to identify each MPC Platinum.

SPACE LOCK

On or Off

Default: Off

System Settings/More Settings/Remote Interface/Space Lockout

The Space Lockout is required to be set to On to be able to use Space sensors for Day Target and Night Target. This option can be set when the MPC Platinum has any of the communication packages.

```
--- SPACE LOCKOUT ---
>Off
On
```

 *Press to select*
 *Lock*

DAY TARGET

55°F to 85°F

Default: 75°F

System Settings/More Settings/Remote Interface/Day Target

The Day Target is the space temperature the MPC Platinum will try to reach during the Boost period when coming out of the Night Time setting.

```
---- DAY TARGET ----
75F
[---- ]
```

 *Turn to adjust*

NIGHT TARGET

50°F to 80°F

Default: 65°F

System Settings/More Settings/Remote Interface/Night Target

The Night Target is the space temperature the MPC Platinum will try to reach during the Early Shutdown ESD period when switching from the Day setting.

```
--- NIGHT TARGET ---
65F
[---- ]
```

 *Press to select new*

INTERNET ID

Solo, 1 through 32, Custom

Default: Solo


System Settings/More Settings/Remote Interface/Internet ID

For RINet controls The Internet ID is the configuration that allows the control to communicate over the Internet. Solo should be used if the control is connected directly to the ISP modem. IDs of 1 through 32 can be used when the one or multiple controls are configured behind an Internet Router that has DHCP activated (Contact Heat-Timer Customer service for purchasing and configuring an Internet Router.) Custom, is used when the control is to be configured to communicate to the Internet behind a Server or other specialized configurations.

```
---- INTERNET ID ---
>Solo
1 - 32
Custom
```

 *Turn to adjust*

```
- NETWORK SETTINGS -
>IP ---,---,---,---
Msk ---,---,---,---
Gwy ---,---,---,---
DNS ---,---,---,---
```

 *Press to select new*

SCHEDULE AND SHIFT

SETTING THE TIME AND DATE

- Setting the time correctly is critical for MPC operation. If the time wrong, the control will not provide heat when it is expected.
- The date is important if using the automatic update for Daylight Savings (see pg. 14), and if the control is equipped with the Remote Communications option.
- When initially powered up, the MPC defaults to 2Pm on 1/1/00. To change this, select the *Set Date/Time* menu.
- Correct the date by selecting *Date* from the menu, and then set the *Year*, *Month*, and *Day*. To change the displayed setting, rotate the *ADJUST/SELECT* knob until the desired number is displayed. Then press the knob to save the number and the control will automatically advance to the next setting.
- Correct the time by selecting *Time* from the menu. Rotate the *ADJUST/SELECT* button to change the hours. Be sure that *Am* or *Pm* is correct after the time. If not, continue to rotate the knob to advance 12 hours. Then press the *ADJUST/SELECT* knob to change the minutes. Rotate the knob until the minutes are correct and then press the knob to save the time.

THE DAY/NIGHT SCHEDULE

- The MPC has two heat levels. The *Day* settings are for when a building is occupied and people are active. The *Night* settings hold a lower ambient temperature and are for when a building is unoccupied, or people are sleeping.
- Each time the MPC updates the clock's minute, it checks the *Schedule*. If the current time matches a time on the schedule, the MPC will switch to that heat level. If the current time does not match anything on the schedule, the MPC will continue to hold the existing heat mode, either *Day* or *Night*. A hypothetical example is shown on pg. 25.
- The first day setting, *#1*, is important as it starts the Boost period. This is designed to allow a building to quickly recover from the lower *Night* temperatures. For details, see pg. 20.
- The MPC comes pre-programmed to switch the control into the higher *Day* settings at 6 Am and to go back to the lower *Night* settings at 10 Pm every day of the week. If this standard schedule fits your building, there is no need to make any further adjustments.
- The MPC can be programmed for up to four *Day/Night* periods starting at adjustable times for every day of the week.
- It is not necessary to program every day. For example, in an office building, it may be desirable to leave the MPC in *Night* throughout the weekend. In that case, if the schedule for Saturday and Sunday are cleared, the control will switch into *Night* on Friday evening, and not switch back into *Day* until Monday morning. (Note that after the heat has been lowered all weekend, it may take longer to recover, so the time to switch to *#1 Day* on Monday may need to be earlier than on the other days of the week.)

```

DATE           TIME
CYCLE STATUS
Cutoff        Day/Night
Out Temp      Sys Temp
    
```

ADJUST  Press for Menu
PRESS TO SELECT

```

--- SETTINGS ---
>Shift
<System Settings>
<Schedules>
    
```

ADJUST  Press for Shift or turn
PRESS TO SELECT

```

--- SETTINGS ---
<System Settings>
><Schedules>
<Maintenance>
    
```

ADJUST  Press for Schedule
PRESS TO SELECT

```

---- SCHEDULES ----
>Day/Night Schedule
Copy Schedule
Set Date/Time
    
```

ADJUST  Press for Day/Night
PRESS TO SELECT

```

---- SCHEDULES ----
Copy Schedule
>Set Date/Time
Aux Schedule
    
```

ADJUST  Turn to scroll down
PRESS TO SELECT

```

---- SCHEDULES ----
Copy Schedule
>Set Date/Time
Aux Schedule
    
```

ADJUST  Press to set Date/Time
PRESS TO SELECT

SETTING TIMES

```

Current or
Schedule Time
6:00 Am
    
```

ADJUST  Turn to adjust hour
PRESS TO SELECT

```

Current or
Schedule Time
10:** Pm
    
```

ADJUST  Press to select hour
PRESS TO SELECT

```

Current or
Schedule Time
10:00 Pm
    
```

ADJUST  Turn to adjust minutes
PRESS TO SELECT

```

Current or
Schedule Time
10:30 Pm
    
```

ADJUST  Press to select minutes
PRESS TO SELECT


SETTING THE DAY/NIGHT SCHEDULE

- The MPC has four Day and four Night settings for each day of the week. They are designated as *MON #1 Day Time*, *MON #1 Night Time*, *MON #2 Day Time*, *MON #2 Night Time*, etc.
- The first time to be set will be *MON #1*. Adjust the Day and Night times as desired.
- Push the button marked *NEXT* to advanced to *MON #2*. If this has not been programmed, the display will show ***:***. If you wish to set a time for *MON #2*, press the *SELECT* button and adjust. Otherwise continue to push the *NEXT* button to see the rest of the scheduled settings for Monday.
- To set or check the other days of the week, you must first enter the Schedule menu so *MON #1* is displayed. Then press the *DAY* button to advance to *TUE #1*, *WED #1*, etc.

Note: It is only necessary to set as many Day/Night settings as you wish your building to have. The MPC simply ignores any schedule items shown as ***:***.


```

--- SCHEDULES ---
      MON #1
>Day Time:
Night Time:
    
```

 *Press for next setting*

```

--- SCHEDULES ---
      MON #2
>Day Time:
Night Time:
    
```

 *Press for next day*

```

--- SCHEDULES ---
      TUES #1
>Day Time:
Night Time:
    
```

 *Turn to adjust*

```

--- SCHEDULES ---
      TUES #1
  Day Time:
>Night Time:
    
```

 *Press to select Night*

SCHEDULE EXAMPLE

Schedule		Day of Week						
		Mon	Tues	Wed	Thurs	Fri	Sat	Sun
#1	Day	6 am	6 am	6 am	6 am	7 am	**	**
	Night	10 pm	10 pm	10 pm	10 pm	11 am	**	**
#2	Day	**	**	**	**	1 pm	8 am	**
	Night	**	**	**	**	4 pm	4 pm	**
#3	Day	**	**	**	**	**	**	**
	Night	**	**	**	**	**	**	**
#4	Day	**	**	**	**	6 pm	**	**
	Night	**	**	**	**	10 pm	**	**

Monday through Thursday

Vari-Boost begins before 6 am and ends at 6 am

Day temperature level is maintained from 6 am to 10 pm

Night temperature level is maintained from 10 pm until the Vari Boost the following morning

Friday

Vari Boost begins before 7 am and ends at 7 am

Day temperature level is maintained from 7 am to 11 am

Night temperature level is maintained from 11 am to 1 pm

Day temperature level is maintained from 1 pm to 4 pm

Night temperature level is maintained from 4 pm to 6 pm

Day temperature level is maintained from 6 pm to 10 pm

Night temperature level is maintained from 10 pm until 8 am Saturday morning

Saturday

No Vari Boost because the #1 is not programmed

Day temperature level is maintained from 8 am to 4 pm

Night temperature level is maintained from 4 pm into Sunday

Sunday

Night temperature level is maintained all day Sunday, ending at the Vari Boost Monday morning

COPYING MONDAY'S SCHEDULE

- If it is desirable to have the same Day/Night schedule for every day of the week, select the *Copy Schedule* menu item. This will copy Monday's Day/Night schedule to the remaining days of the week.
- When using the Copy Schedule function, all four Day/Night settings will be copied. Therefore, carefully check all four Monday settings before copying.
- Note that the Copy Schedule function does NOT copy the Aux Clock Schedule (see pg. 27).

```

---- SCHEDULES ----
  Day/Night Schedule
>Copy Schedule
  Set Date/Time
    
```

ADJUST  Press to enter function
PRESS TO SELECT

```

---- SCHEDULES ----
      Copy Mon To
      All Other Days
SELECT to Execute
    
```


ADJUST  Press to copy schedule
PRESS TO SELECT

CLEARING A SCHEDULED TIME

- The MPC will ignore any schedule setting which is cleared. A cleared setting will be displayed as **:**.
- Settings can only be cleared in Day/Night pairs. To clear just a Day or a Night setting, you must clear both and then reprogram just the desired one.
- To clear the pair of settings, press the *PREV (DEL)* button.

```

--- SCHEDULES ---
      MON #2
>Day Time  7:00 Am
Night Time 9:00 PM
    
```

 Press to clear
PREV (DEL)

```

--- SCHEDULES ---
      MON #2
>Day Time  **:**
Night Time  **:**
    
```

SHIFT

- There may be times when it is desirable to temporarily override the schedule because of special circumstances such as a holiday or a school activity that has run over its scheduled time. Rather than adjusting the Day/Night schedule to meet this special circumstance, and possibly forgetting to restore the correct settings afterward, the MPC is equipped with a Shift option.
- The Shift option will immediately change the status of the MPC from Day to Night, or Night to Day, without changing the program schedule.
- By selecting *Shift from Day to Night* or *Shift from Night to Day*, the shift is permanent until the clock advances to the next setting on the schedule. For instance, if the control is shifted into Night on Friday afternoon at 3 pm, and the next Day setting is not until Monday at 6 am, the control will stay in Night until Monday morning at 6 am.
- By shifting *Extend Day Sched*, the shift from Night into Day will only last a selectable period of time from 60 to 240 minutes. Use this shift when a short extension of the higher heat level is required, such as might occur when a school game goes into overtime. The MPC will automatically return to Night after the time period has elapsed.
- By selecting *Schedule*, the MPC will check the schedule and set the heat level accordingly.

```

DATE           TIME
  CYCLE STATUS
Cutoff  Day/Night
Out Temp  Sys Temp
    
```

ADJUST  Press for Menu
PRESS TO SELECT

```

--- SETTINGS ---
>Shift
<System Settings>
<Schedules>
    
```

ADJUST  Press for Shift
PRESS TO SELECT


```

SHIFT FROM
>Extend Day Sched
Day or Night
Schedule
    
```

ADJUST  Press to Extend
PRESS TO SELECT

```

SHIFT FROM
  Extend Day Sched
>Day or Night
Schedule
    
```

ADJUST  or turn to scroll down
PRESS TO SELECT

```

SHIFT FROM
  Extend Day Sched
>Day or Night
Schedule
    
```

ADJUST  Press to select new
PRESS TO SELECT

AUX CLOCK SCHEDULE

- The Auxiliary (Aux) Clock provides an extra relay output which switches based only on the time of day.
- The relay status is programmable with a *Close Time* when the relay will be energized and an *Open Time* when the relay will be de-energized. There are four Close/Open Time pairs available for each day of the week.
- The Aux Clock relay is not affected by outdoor temperature, but acts as a separate time clock which can be used to turn on lights, fans, dampers, or other equipment.
- The Aux Clock has a separate program from the Day/Night Schedule, but the times are set in the same fashion. Note the Copy function does not work with the Aux Clock. Each day must be programmed individually.

```

--- SETTINGS ---
>Shift
<System Settings>
<Schedules>
    
```

ADJUST  Press for Shift or turn

```

--- SETTINGS ---
<System Settings>
><Schedules>
<Maintenance>
    
```

ADJUST  Press for Schedule


```

---- SCHEDULES ----
Copy Schedule
>Set Date/Time
Aux Schedule
    
```

ADJUST  Turn to scroll down

```

---- SCHEDULES ----
Copy Schedule
Set Date/Time
>Aux Schedule
    
```

ADJUST  Press to set Aux

MAINTENANCE MENU

TRIM

- The Heat-Timer thermistor type sensors are very accurate, and normally require no calibration. To check the sensor reading, see pg. 30.
- Sometimes it may be desirable to make small adjustments to the displayed value for either the outdoor temperature or the HSS. The Trim setting can adjust the displayed value by $\pm 5^{\circ}\text{F}$.
- Do not use the Trim setting to make the Outdoor temperature sensor match that reported on the radio or TV. Outdoor temperature can vary widely over a broadcast range. Only trim the outdoor sensor based on an accurate thermometer reading taken where the sensor is located.

```

DATE          TIME
CYCLE STATUS
Cutoff      Day/Night
Out Temp    Sys Temp
    
```

ADJUST  Press for Menu


```

--- SETTINGS ---
>Shift
<System Settings>
<Schedules>
    
```

ADJUST  Turn to scroll down

```

--- SETTINGS ---
<Schedules>
><Maintenance>
<System Startup>
    
```

ADJUST  Press for menu


```

MAINTENANCE MENU
>System Trim
Outdoor Trim
Fast Cycle
    
```

ADJUST  Press to select Trim

```

-- SENSOR TRIM --
Value -> New Value
    
```

ADJUST  Turn to adjust

```

-- SENSOR TRIM --
Value -> New Value
    
```

ADJUST  Press to select New

FAST CYCLE

- The Fast Cycle button changes cycle minutes to cycle seconds, so a 60 minute cycle can be reviewed in 60 seconds.
- The Fast Cycle can be used to test the boiler or valve. If the control is in the OFF part of a cycle, selecting *Fast Cycle On*, will allow the remaining cycle to be completed in less than a minute. At that point, as long as the Thermal Lockout is OFF, the MPC will bring on the boiler or open the valve.
- Note the Fast Cycle feature only works when the MPC is in a cycle. It cannot be used to override the Heat Established function or to prevent the Thermal Lockout.

CAUTION: After testing, be sure to reset the Fast Cycle feature to *Off*. Failure to do so will result in erratic behavior characterized by underheating and boiler/steam valve short cycling.

```

MAINTENANCE MENU
>System Trim
Outdoor Trim
Fast Cycle
    
```

ADJUST

 PRESS TO SELECT
Turn to adjust

```

MAINTENANCE MENU
System Trim
Outdoor Trim
>Fast Cycle
    
```

ADJUST

 PRESS TO SELECT
Press to select Fast

```

FAST CYCLE TEST
>Off
On
    
```

ADJUST

 PRESS TO SELECT
Press to select Off

PASSWORD DEFAULT DISABLED

- The Password is provided to prevent unauthorized users from making changes to MPC settings.
- Setting up the Password feature is not recommended as it slows down access, makes servicing more difficult, and can disable the system if management or ownership should change.
- The Password feature is not active unless a user enables it.
- If you choose to enable the Password, **DO NOT** forget the Password. Write it down and store it in a safe location known to at least one other authorized user.
- When the Password is enabled, none of the settings can be changed without entering the Password.
- Once the Password is entered, you can make multiple changes. The Password will expire 15 minutes after the last change has been made.

```

MAINTENANCE MENU
Outdoor Trim
Fast Cycle
>Password
    
```

ADJUST

 PRESS TO SELECT
Press to select

```

PASSWORDS ENABLED?
No
>Yes
    
```

ADJUST

 PRESS TO SELECT
Press to select

```

---- LOGIN ----
Enter password:
A***
    
```

ADJUST

 PRESS TO SELECT
Turn to adjust Letter

```

---- LOGIN ----
Enter password:
M***
    
```

ADJUST

 PRESS TO SELECT
Press to select Letter

```

---- LOGIN ----
Enter password:
MA**
    
```

ADJUST

 PRESS TO SELECT
Turn to adjust next

```

---- LOGIN ----
Enter password:
MPCX
    
```

ADJUST

 PRESS TO SELECT
Press to select

USING THE DEFAULT PASSWORD

- The MPC has a built in default Password - MPCX.
- Enabling the default Password will prevent most unauthorized users from adjusting the settings, but will not prevent Heat-Timer service personnel, or anyone else with access to this manual, from adjusting the control.
- To enable the default Password, enter the *Maintenance* menu, select *Password*, and follow the prompts to enable the Password.
- At the Login screen, you will have to enter the Password. Turn the *ADJUST/SELECT* knob until the desired letter is shown. Then select the letter to move on.
- Enter *MPCX* into the Login screen.
- When completed, select *No* to the prompt *Change Password?*

CHANGING THE PASSWORD

- Follow the instructions to use the default Password, but select *Yes* to the prompt *Change Password?*
- Enter your new Password in the *New Password* screen. Turn the *ADJUST/SELECT* knob until the desired letter is shown. Then select the letter to move on.
- Reenter the same new password when prompted.
- If the password is correctly entered, the *Success* screen will appear. If you made a mistake, the procedure will need to be repeated.

```
CHANGE PASSWORD?  
No  
>Yes
```



Press to
select

```
-- NEW PASSWORD --  
Enter NEW password:  
A***
```



Turn to
adjust
Letter

```
-- NEW PASSWORD --  
Enter NEW password:  
M***
```



Press to
select
Letter

After setting all letters

```
-- NEW PASSWORD --  
RE-enter password  
A***
```

After resetting all letters

```
-- !! SUCCESS !! -  
-  
Password  
changed!
```



Press to
finish

ACCESSING THE STARTUP MENU

- On the initial start-up, the MPC will automatically step through the System Startup. After that, it must be reached through the menu system.
- **DO NOT** make changes to the System Startup unless you have carefully checked the installation. An incorrect setting in the System Startup menus may cause the MPC to be unable to activate the heating system or may cause the MPC to behave erratically.
- **DO NOT** make changes to the System Startup unless you have copied all other settings and are prepared to restore them. Some changes in the System Startup may cause the System settings or Schedule to revert to their default values.
- From the main display, press the *ADJUST/SELECT* knob and release it to reach the *Settings* display.
- Scroll down to *<System Startup>* and select it.
- The screen will show *System Startup* and *Select to continue*.
- Read and follow the prompts until *Sensor Type* is displayed.
- Follow the directions starting on pg. 12 to set each item correctly.

WARNING:

DO NOT make changes to the System Startup Menu without first carefully reading the preceding section. Making changes to the System Startup may cause the MPC to no longer control the heating system or to control the system erratically.

TROUBLESHOOTING

Temperature Sensor Chart

TEMPERATURE INPUTS

Display shows SENSOR FAULT - OPEN

The MPC does not register that the sensor is connected. The display will indicate if the problem is with the Outdoor sensor (flashing *OPEN* after *OD*) or the HSS (flashing *OPEN* after *SYS*) Check that the wires from the sensor are continuous to the MPC. Then follow the procedure for Incorrect Temperature Display.

Display shows SENSOR FAULT - SHORT

The MPC sees a short across the sensor input terminals. If the problem is with the Outdoor sensor (flashing *SHORT* after *OD*) then remove the sensor wires from the terminals marked *OUT TEMP*. If the problem is with the HSS (flashing *SHORT* after *SYS*) then remove the sensor wires from the terminals marked *SYSTEM TEMP*. The respective display should change to flash *OPEN*. If they don't, the MPC may be damaged.

Display shows an Incorrect Temperature Display

Remove the wires from the temperature sensor reading incorrectly. That is, remove the two sensor wires from the *SYSTEM TEMP* terminals if the HSS is reading incorrectly or from the *OUT TEMP* terminals if the outdoor temperature is reading incorrectly. The display should change to flash *OPEN*. If it doesn't, the MPC may be damaged. Take an ohm reading across the detached sensor wires. The ohm reading should correspond to the chart at right. If it doesn't, the sensor may be damaged.

TEMPERATURE (in degrees F)	Value (in Ohms)
0	42683
10	31215
20	23089
25	19939
30	17264
35	14985
40	13040
45	11374
50	9944
55	8714
60	7653
70	5941
80	4649
90	3667
100	2914
110	2332
120	1879
130	1524
140	1243
150	1021
160	842
170	699
180	583
190	489
200	412

OTHER INPUTS

Remote Shutdown not Working

Test the MPC by shorting out the two *SHUTDOWN* terminals directly. The MPC should immediately disable the Output relays. The *SYS* relay will remain energized for the time period set by the *Sys Run-On*. If the MPC works correctly, check the remote shutdown source and the wiring to the MPC.

Display reads *Waiting for Prove*

The Prove terminals must be shorted for the MPC to provide heat. If the factory installed jumper has been removed, check an appropriate dry contact signal is connected to the MPC.

OUTPUT Relays

Both Red Lights marked *OUTPUT* are On but the Heating System is not Active

Remove all wires connected to output terminals 4 through 8. Check for continuity across the terminal pair 4 and 5 and across the terminal pair 7 and 8. Then check the terminal pair 5 and 6 are open. If these are all correct, the MPC is working. Check the heating system.

Both Red Lights marked *OUTPUT* are Off but the Heating System is Active

Remove all wires connected to output terminals 4 through 8. Check for continuity across the terminal pair 5 and 6. Then check the terminal pair 4 and 5 and the terminal pair 7 and 8 are open. If these are all correct, the MPC is not activating the heating system. Check the heating system.

SYS, AUX, and OPTION Relay Outputs

The appropriate Red Light is on but the equipment does not run

If the red indicator light is on, the MPC will energize the appropriate relay, closing the Normally Open contact pairs.

Remove all wires attached to the pair of output terminals in question:

For *SYS* relay, terminals 9 and 10

For *AUX* relay, terminals 11 and 12

For *OPTION 1* relay, terminals 13 and 14

For *OPTION 2* relay, terminals 15 and 16

For *OPTION 3* relay, terminals 17 and 18

Check for continuity across the pair of terminals. If the terminals are continuous, the MPC is working correctly.

Check the equipment to determine why it is not running.

Equipment is running but the Red Light is off

If the red indicator light is off, the MPC has not energized the relay (see relay and terminal list above). Remove all wiring to the terminals and check that the appropriate pair of terminals is open. If so, the MPC is working correctly.

Check the equipment to determine what else is causing it to run.

Operating problems

No Heat

If there is no heat, the MPC may or may not be the cause of the problem. If the Output indicator lights are on, then the MPC is calling for heat, follow the steps under "Both Red Lights marked *OUTPUT* are On but the Heating System is not Active". If the lights are not on, checking the second line of the display allows you to quickly determine if the MPC is in the Summer mode, if the MPC has been Shutdown, if the MPC is waiting for a Prove signal, and so on.

Follow the flow chart on page 31 to help isolate the problem.

Too Little Heat

As in the case of No Heat (above) the MPC may or may not be causing the problem. Follow the flow chart on page 32 to help isolate the problem.

Too Much Heat

Too much heat is often caused when the MPC is switched to *BYPASS* and not switched back to *AUTO*. The Bypass function supersedes all other MPC functions. For other sources of overheating, follow the flow chart on page 33.

Sporadic occurrence of No Heat, too Little Heat, or too Much Heat

Check the Schedule to be sure the Day and Night settings are as expected. Go through all four setting for each day of the week, making sure any unused setting display **:**. Also check that Am and Pm are programmed correctly, since if these are incorrect, the program will be 12 hours off.

Too Little Heat or too Much Heat at the #1 Day time

Adjust your Boost. The Vari Boost changes with outdoor temperature, and is therefore recommended over the fixed Manual boost. If there is too little heat, adjust the Vari Boost curve up one number, if there is too much heat, adjust the curve down.

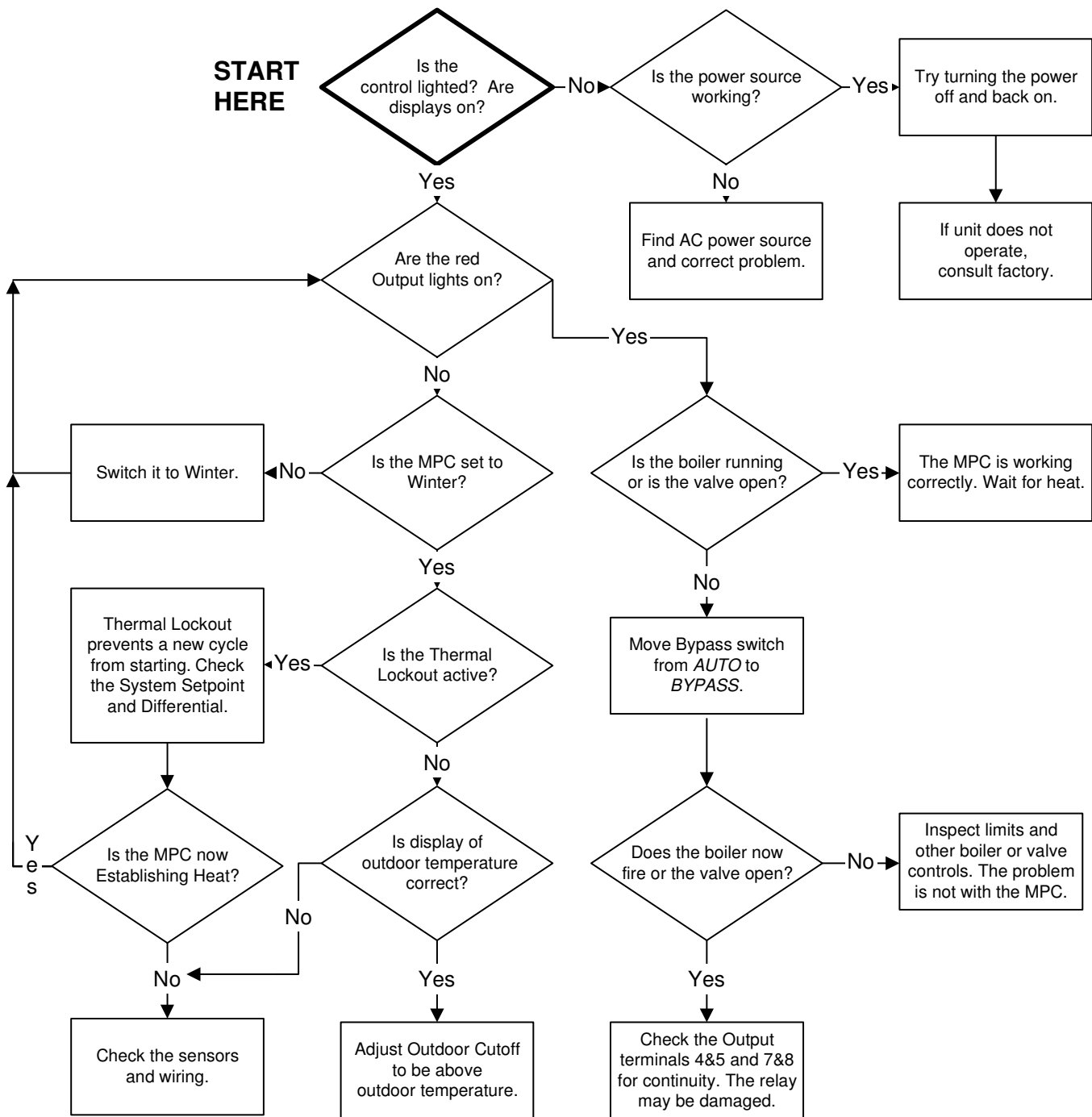
Have too Little Heat Before the Last Night Program

You may not wish to use the Shutdown feature or may want to reduce the Vari Boost curve to decrease the Shutdown time. Note adjusting the Vari Boost curve to reduce the amount of Shutdown time will also reduce the amount of Morning Boost.

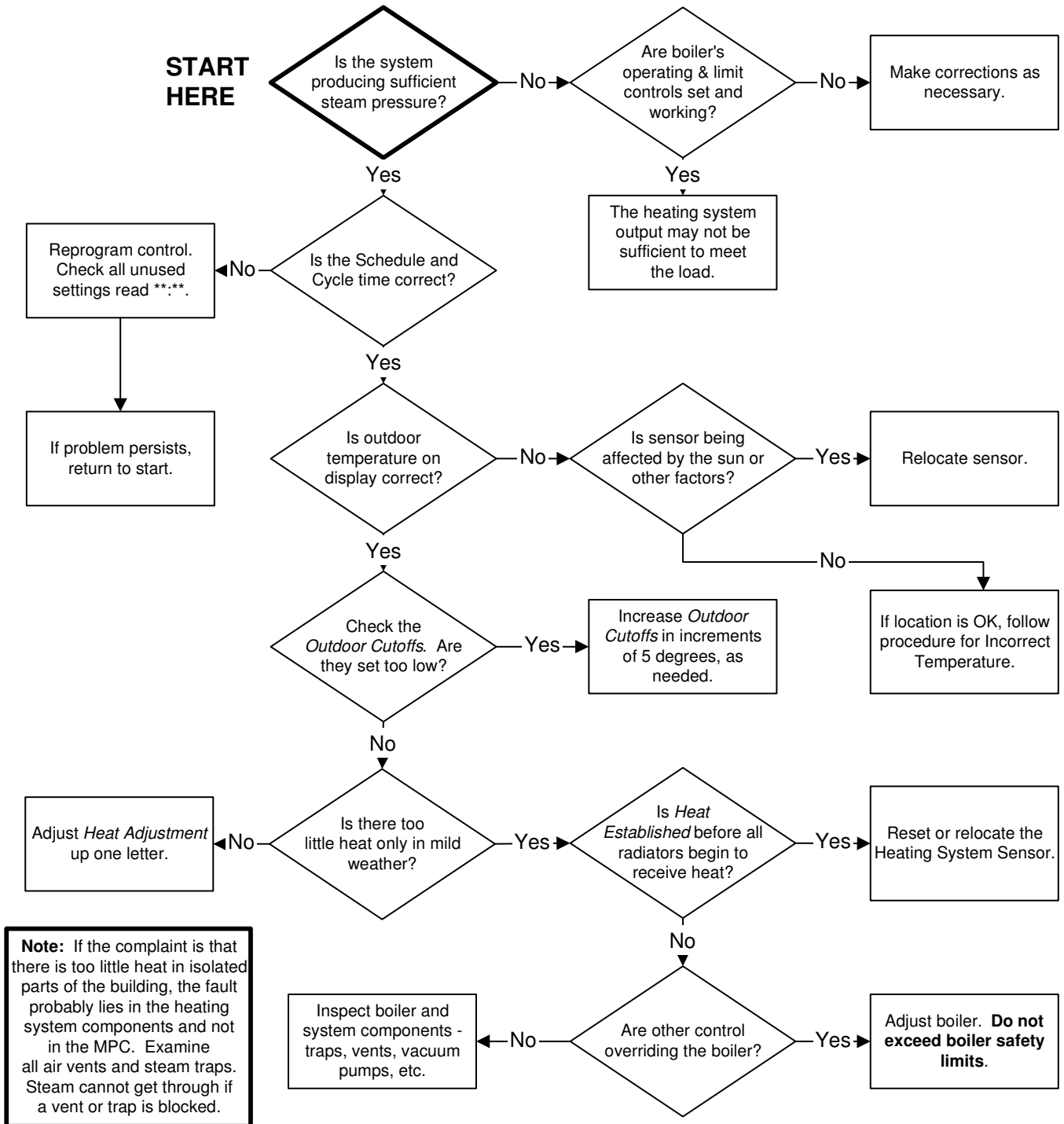
Have too Much or too Little Heat Only in Parts of the Building

Check the HSS location, System Set Point, and Differential. The last radiator in the system should begin to get warm before the MPC goes into cycle. If the HSS is located and set appropriately, then the problem is with the steam distribution of the system, not the MPC. Check the sections of the building in question for defective air vents, steam traps, and other components which may be affecting steam delivery.

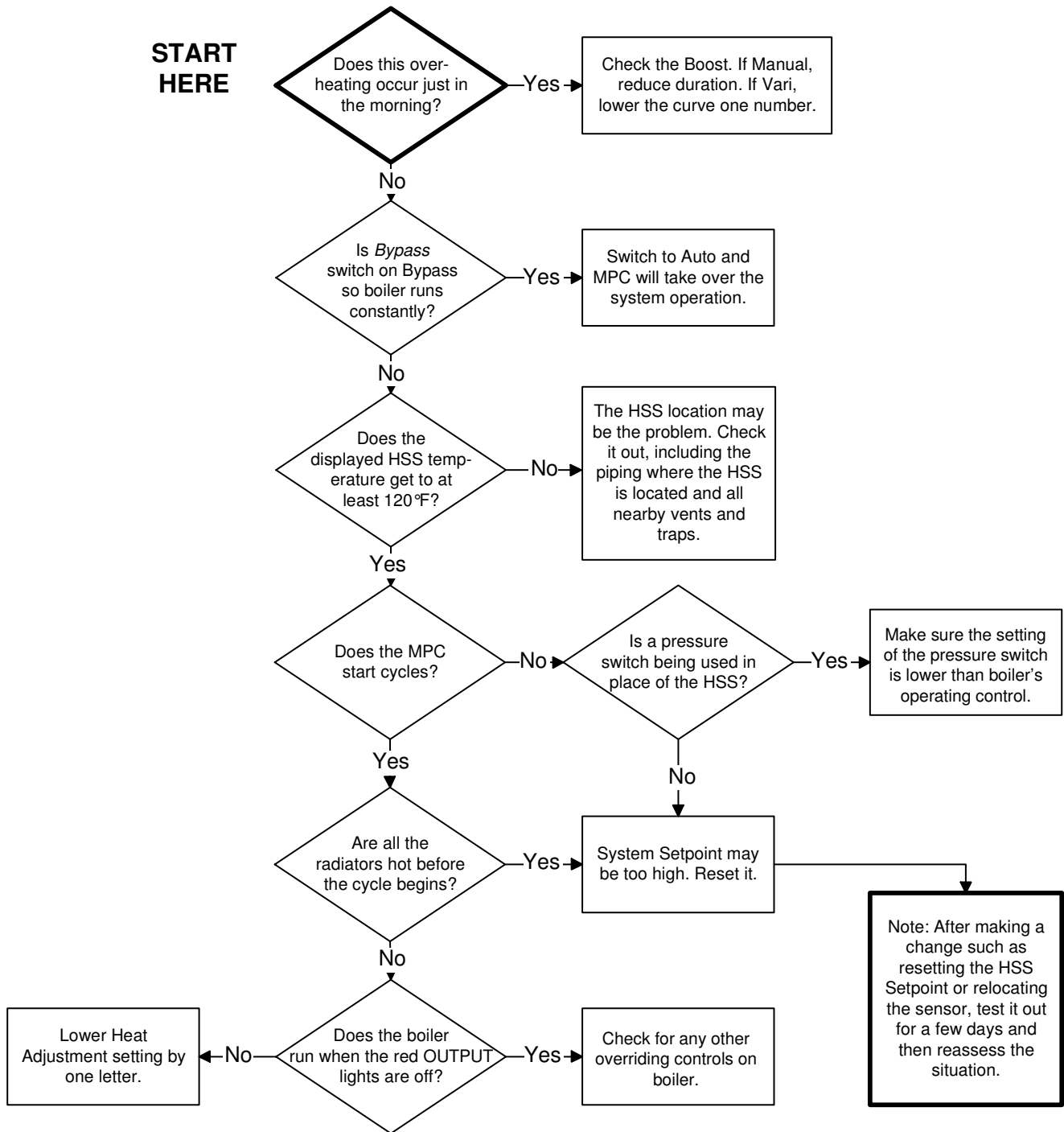
TROUBLESHOOTING: NO HEAT



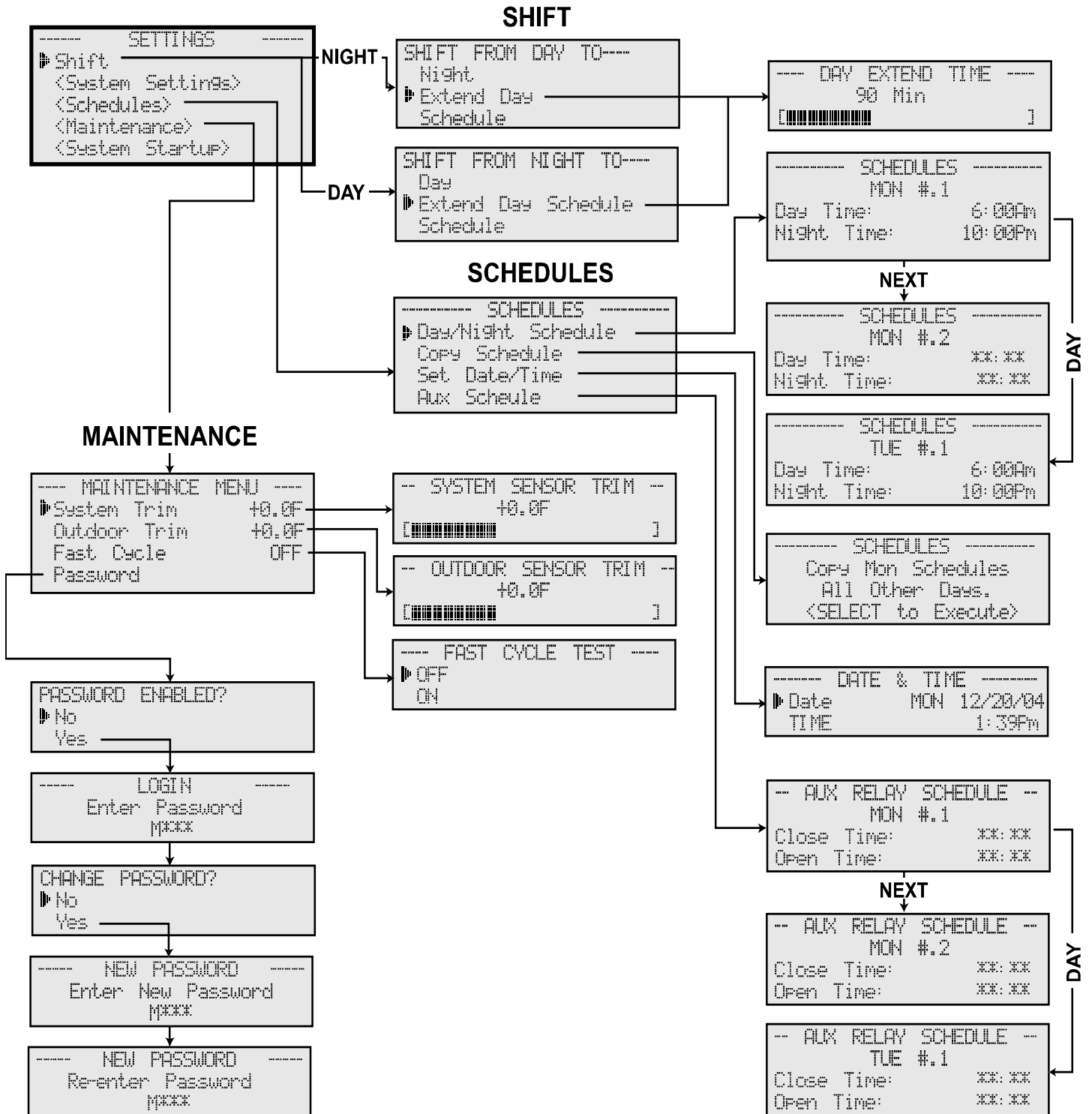
TROUBLESHOOTING: TOO LITTLE HEAT



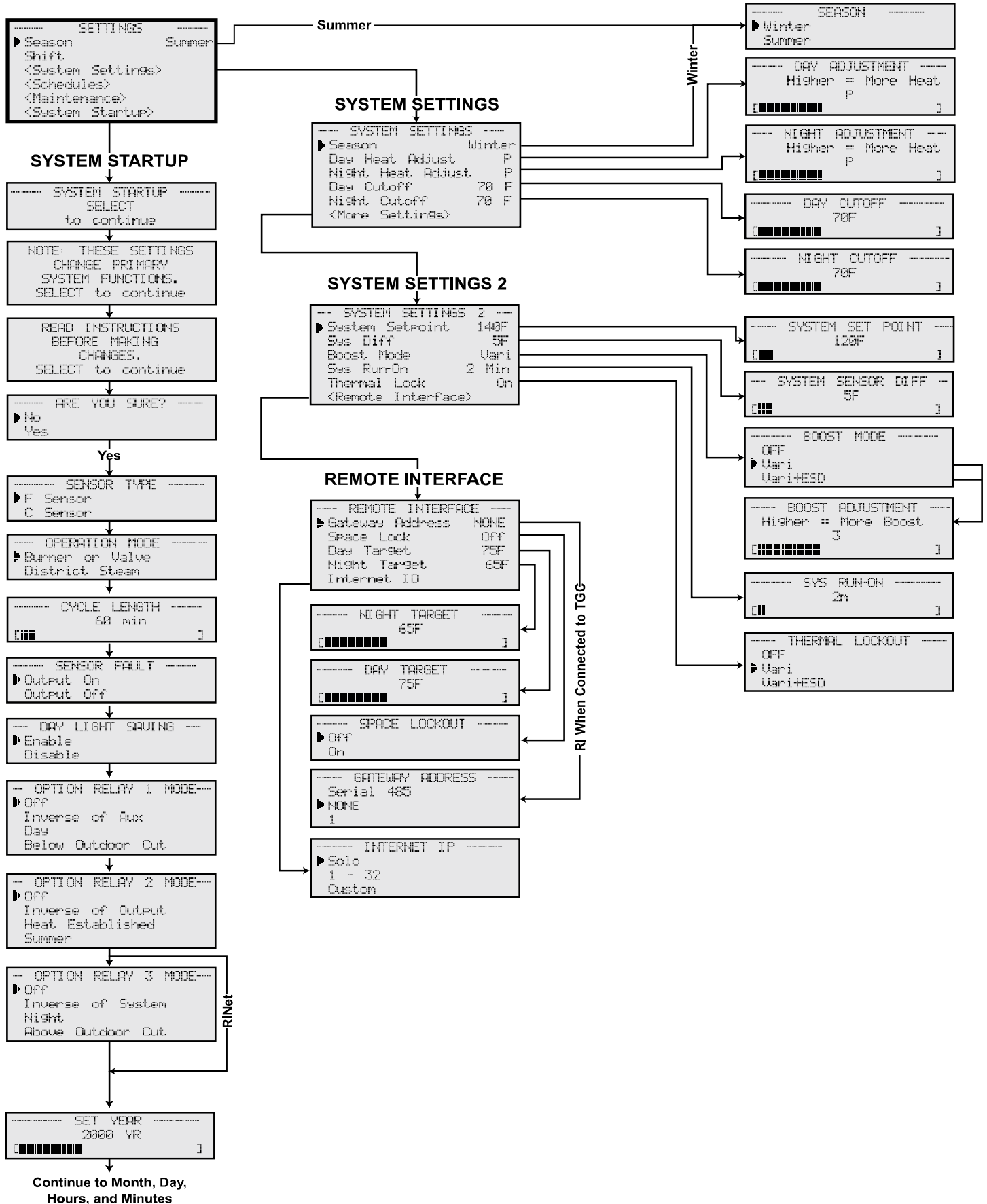
TROUBLESHOOTING: TOO MUCH HEAT



MPC PLAT MENU LAYOUT



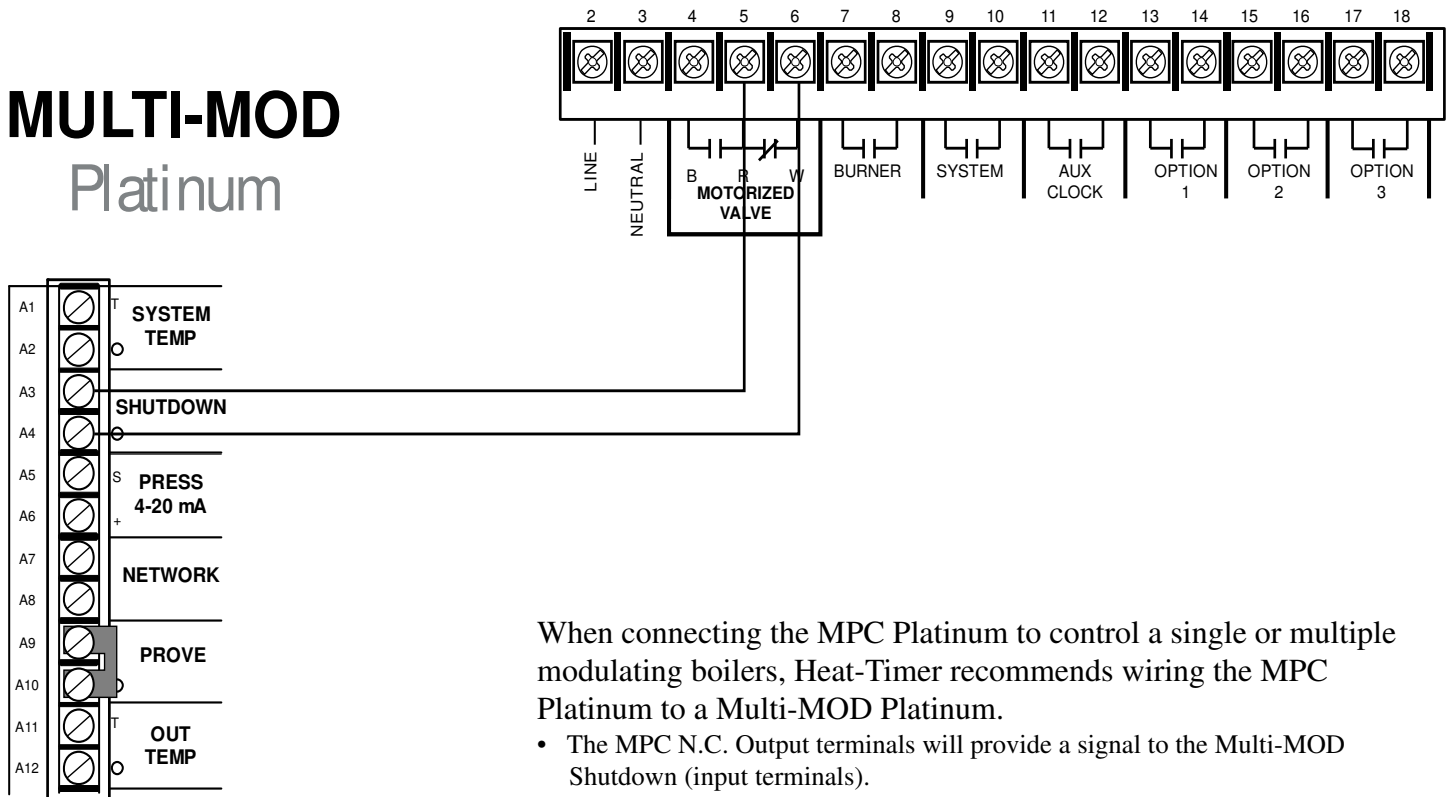
MPC PLAT MENU LAYOUT (CONTINUED)



WIRING MPC PLATINUM TO MULTI-MOD PLATINUM

MPC Platinum

MULTI-MOD Platinum



When connecting the MPC Platinum to control a single or multiple modulating boilers, Heat-Timer recommends wiring the MPC Platinum to a Multi-MOD Platinum.

- The MPC N.C. Output terminals will provide a signal to the Multi-MOD Shutdown (input terminals).
- Set the Multi-MOD to the proper Pressure (Sensor Type).
- Set the Multi-MOD Modulating Mode to Normal.
- Set the Multi-MOD Operating Mode to Normal.
- Set the Multi-MOD Heat/Cool Mode to Heat.
- The MPC Platinum will provide the Multi-MOD with Cycle operation, Thermal Lockout, Space Lock, and Schedules.
- The Multi-MOD will modulate the boilers to maintain a pressure set point.

Specifications:

Voltage Input: 120 VAC 60 Hz
Power Consumption: 30 VA Max/30 Amp Max
Operating Ambient Temperature: 20°F to 120°F
Seasons: Winter and Summer
Heating Modes: Burner/Motorized Valve or District Steam
Cycle Length: 10 to 240 minutes
System Output: 1 S.P.S.T
Boiler Motorized Valve Outputs: 1 N.O. S.P.S.T. for Motorized Valve and 1 N.O. S.P.S.T. for Burner
Auxiliary /Clock Output: 1 N.O. S.P.S.T. operates based on Auxiliary Schedule
Option Outputs: .. 3 N.O. S.P.S.T. can be configured to match or invert cycle, Day/Night, Outdoor Cutoffs, or System or Aux/
Clock relay operations
Output Relay Ratings: 1 Amp inductive, 6Amp resistive at 120 VAC 60 Hz, 15A total for all circuits
Temperature Display: Fahrenheit or Celsius
Display: 80 character Alphanumeric (4 rows with 20 characters each)
Sensor Ranges: Outdoor temperature sensor - minus 35°F to 250°F
Heating system sensor - minus 35°F to 250°F
System Set Point: 70°F to 250°F
System Differential: 3°F to 75°F
Thermal Lockout: On/Off
Auxiliary Sensor Inputs: 3 Auxiliary Temperature Sensor Inputs
Network Sensor Input: 64 Sensors can be connected (Use only Neuron Sensors, MIG, or Wireless Receiver.)
Day / Night Outdoor Cutoffs: 20°F to 100°F
Day/ Night Heat Adjustments: A to P (Changes the ratio of the Cycle On to Cycle Off based on a calculated curve)
System Run-On: 0 to 360 minutes
Schedules: 4 Day Time and 4 Night Time (Setback) settings per day
Aux Clock Schedule: 4 open and 4 closed settings per day to control Aux Clock Output relay
Morning Boost: Vari-Boost - Self-adjusting from 0 to 180 minutes
Manual Boost - adjustable from 0 to 120 minutes
Early Shutdown - Self-adjusting from 0 to 90 minutes
Fast Cycle: For testing only. Changes cycle minutes to seconds
Local Security: Four letter Password Enabled option
Power Backup: Lithium coin battery, 100 days minimum 5 year replacement (Maintains Clock in power outages) Other
parameters are stored in EE Prom
Memory Backup: All control parameters are stored in EE Prom indefinitely
Remote Communications: 1 RS232 and 1 RS485 (RI and RIM controls), Internet (RI-Net only)
External Inputs: 1 Network Input, 3 Aux Inputs, Shutdown Input, and Prove Input
Season: Winter and Summer
Enclosure: NEMA 1
Dimensions: 5-1/8" x 13" x 13"
Weight: 14 pounds

Remote Communication Specifications:

Space Lockout: On/Off
Day Target and Night Target: Day Target (55°F to 85°F), Night Target (50°F to 80°F)
Remote Communication Inputs: 1 Network Input, 3 Aux Inputs